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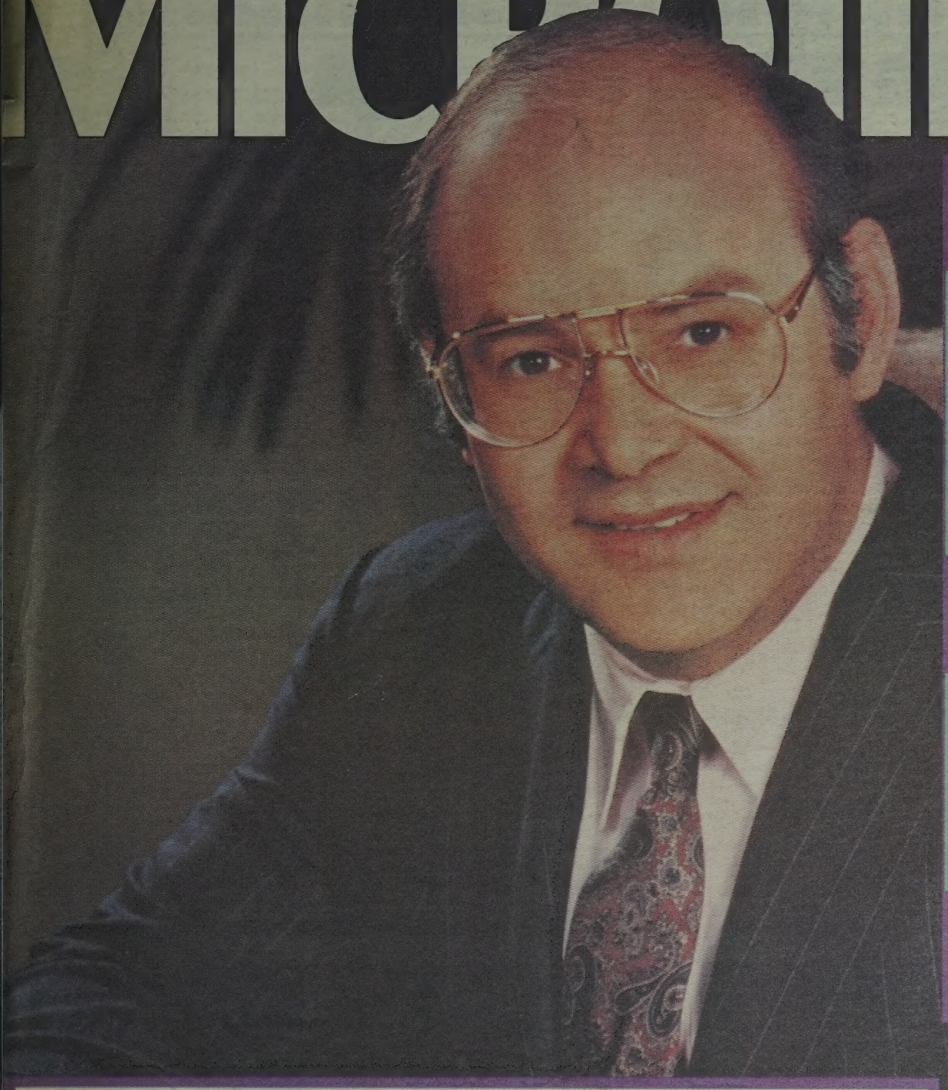

John Perry Barlow On NeXT Software:

"There is a widespread belief that one good reason for not buying a NeXT is that there's no software for it. I've seen this myth erupt before, usually in the general vicinity of Steve Jobs. There are *still* people going around saying that there's no software for the Mac." See page 82

Dvorak And The News From 1998:

"Novell Inc., the Provo, Utah, creator of network operating systems, has signed a definitive merger agreement with Microsoft, the once-successful developer of advanced operating systems." See page 234

DOS 5 For Desktop And Laptop

Intel-Based UNIX

Is Interactive Setting A New Standard?

BY YACCO

Interactive Systems CEO Dennis Peck: "A corporation may say, 'I don't want a closed standard that just addresses my PC space.' To a corporation that wants to dramatically lower its cost, the closed OS/2 offering is not going to be particularly attractive." See page 72

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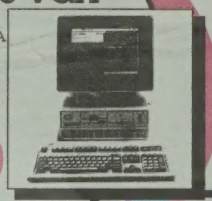

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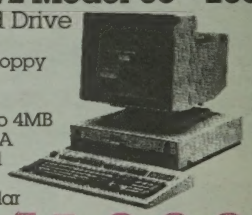

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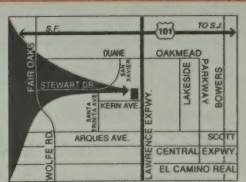

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PC MAGAZINE

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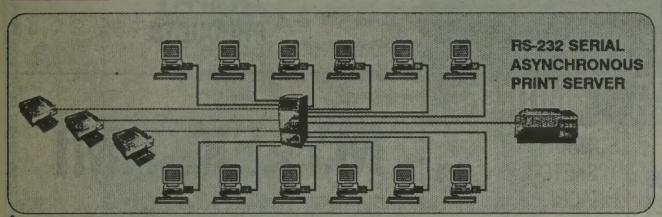

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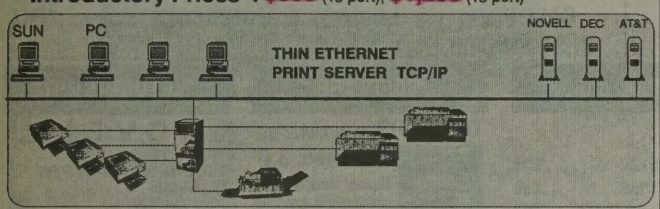

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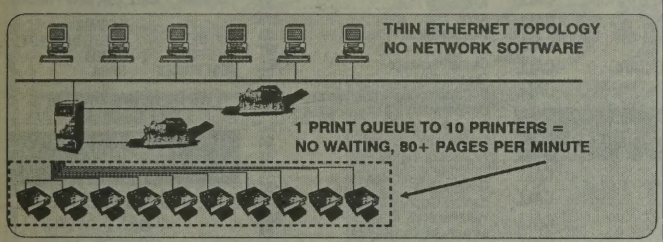

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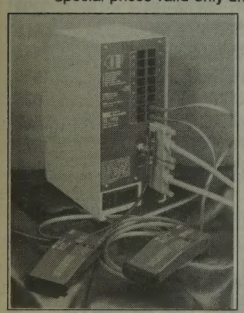

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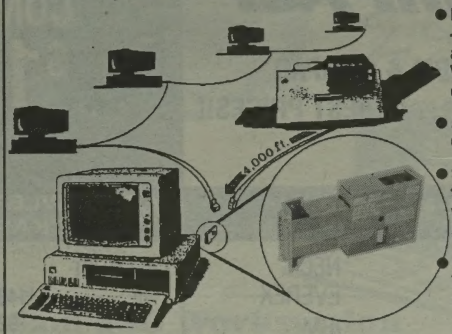

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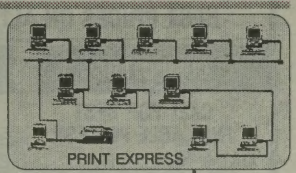

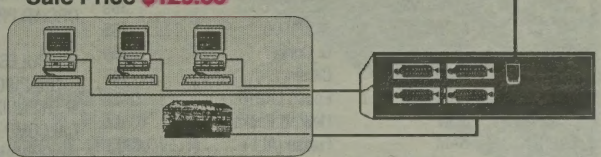

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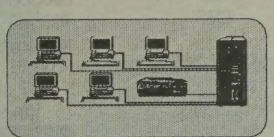

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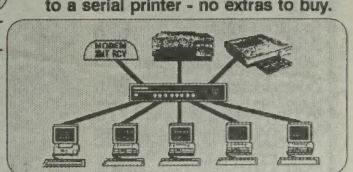

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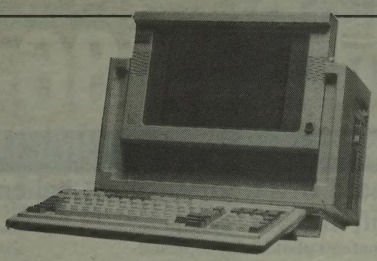

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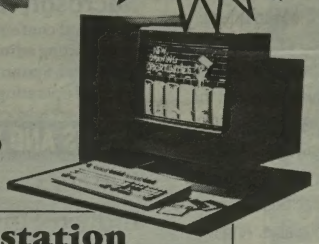

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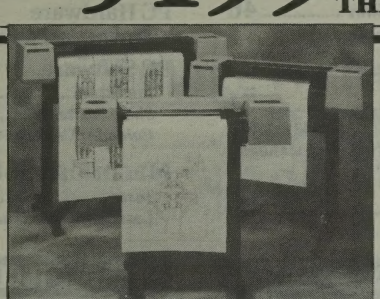

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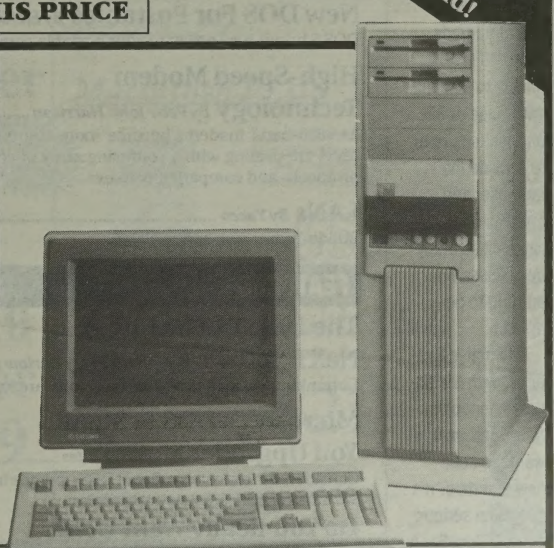

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A NOTE FROM THE EDITORS

If you've got a PC-based office, you've probably spent a lot of time thinking about the changes ahead as powerful 80386- and 80486-based machines become available. And if you're a software developer, you're probably trying to anticipate these changes and create products that take advantage of them.

One of the open questions at this point is what operating system those machines will be running. Despite a huge user base and a recent upgrade, MS-DOS is unable to take full advantage of 32-bit architecture or to provide the multiuser and multitasking capabilities many businesses are starting to demand.

Interactive Systems, with the endorsement of AT&T and Intel, wants to set a new standard. It's got some serious competition. For more about the emerging standards war, see page 72.

—ME

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- Six NuBus expansion slots for custom configuration.

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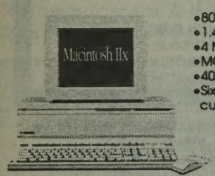

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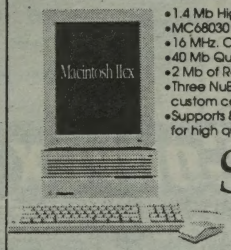

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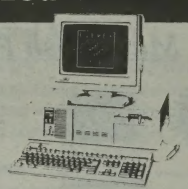

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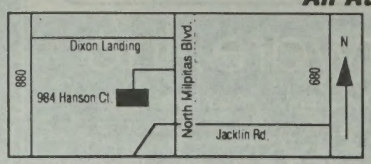

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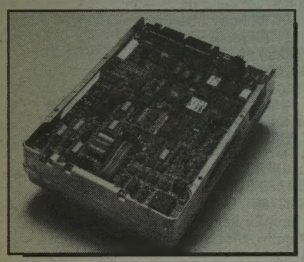

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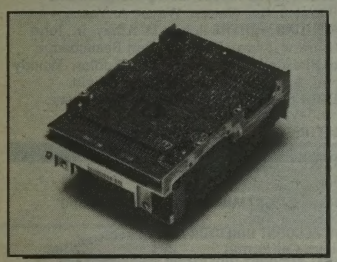

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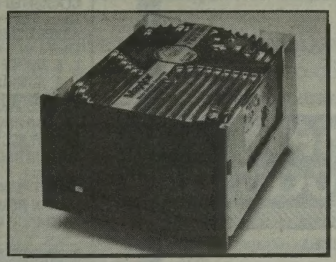

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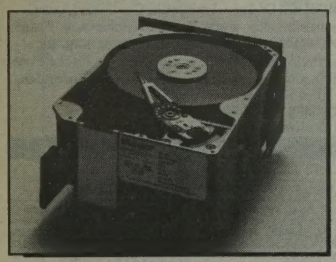

670MB 16.5ms MAXTOR

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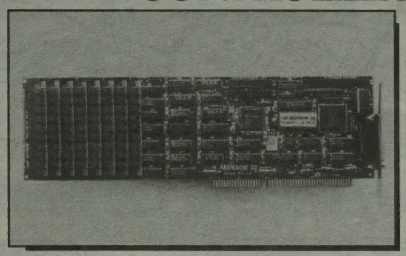

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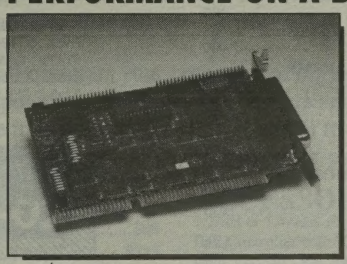

$149 Qty 1

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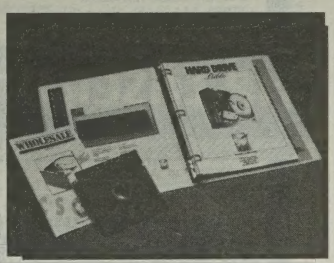

CSC's new edition Hard Drive Bible is the most technical reference on drives available. Included are installation instructions, jumper settings, drive parameter tables, and setup information on hundreds of hard, floppy, tape, and optical drives. Compatibility issues, installation hints, and tips on increasing system performance are included. Don't miss the benchmark chapter with performance and reliability test reports. CSC's drive performance test software is included. Essential reading for dealers and system integrators.

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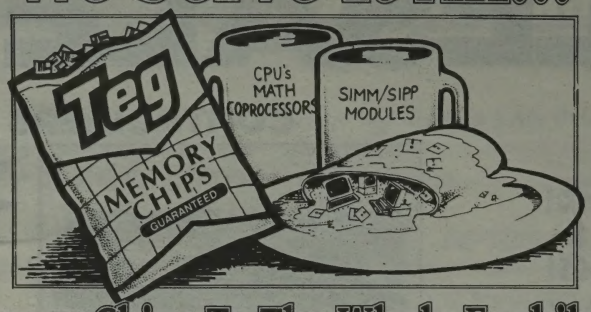

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CONTRIBUTING WRITERS Robert D. Athey, Jr., John Perry Barlow, Lenny Bailes, Robert Beauchamp, Mikael Blaisdell, Ed Kahn, Helmut Kobler, Woody Liswood, Aubrey Pilgrim, Margaret Wright
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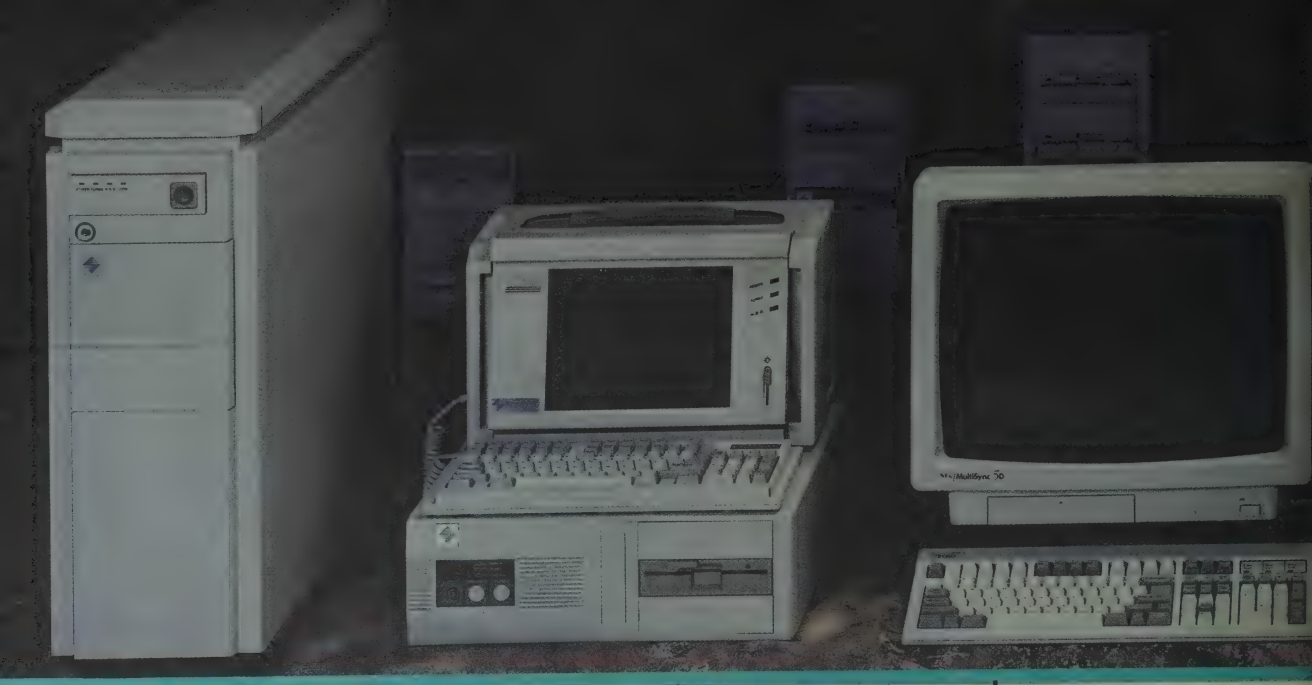

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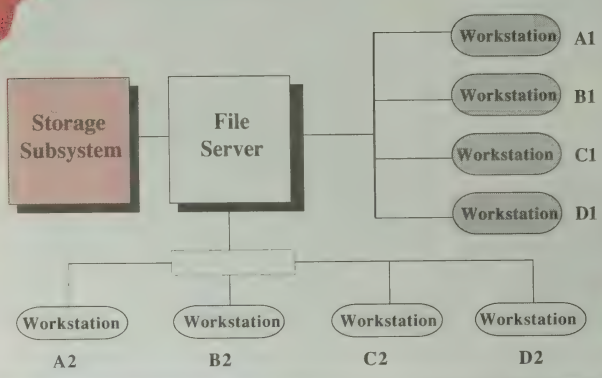

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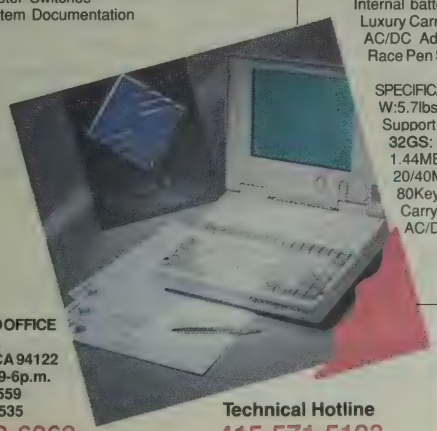

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Letters

THE DEALER WHO DIDN'T CRY "INSANELY GREAT!"

I would like to comment on a recent article entitled "The Boy Who Cried 'Insanely Great!'" by John Perry Barlow (Issue #84). As the Business Development Manager for NeXT Computer products at the first independent NeXT dealership, I praise Mr. Barlow's positive and enthusiastic review of the NeXT computer. The author's prose was entertaining to read and some of the best comments made concerning the features and benefits of NeXT computers. I appreciate his detailed comments concerning the bundled applications and hardware features. His assessment of NeXT as a corporation and what Steve Jobs has brought to marketing the products also rang very true from what I have seen.

However, I must take exception with Mr. Barlow's assessment of pricing of NeXT computer products. It is apparent that he did not do a great deal of research to know that a viable and aggressive nationwide NeXT reseller channel exists. Computer Attic, along with fifteen other dealers across the US and Canada, are committed to the success of NeXT. We have put together several resources to effectively get the word out to our retail and corporate customers of how superior the NeXT is over competing products. We see our job as not only promoting what NeXT has to offer, but also to provide value to our customers through suggesting third-party applications and hardware products which are compatible with NeXT.

On the pricing issue, Mr. Barlow is implying that customers should ask members of the educational and development channel to perform illegal acts. These communities are under contract not to purchase NeXT products for resale. I would like to know how users are to receive hardware and software support once they acquire products from these organizations.

In addition, the author's suggestion of what price customers should look to pay for the equipment is very much out of line with what is possible. Like all the products we sell, we price NeXT according to what price the market will support. To attempt to artificially influence the price is not a help to customers. Legitimate resellers offer a great deal of post sales support not offered by Businessland fire sales or students trying to make a fast buck.

Since NeXT is my entire focus at Computer Attic, I welcome Mr. Barlow's article. As I once heard from someone at NeXT, it is the best kept secret in the world. The more positive press the product line can acquire the better I can do my job. I can only hope I have enlightened Mr. Barlow that there is a dedicated group of resellers nationwide who want all prospective computer buyers to seriously consider NeXT before investing in any computer system.

Steve Sharback
NeXT Business Development Manager
Computer Attic
Palo Alto

AMIGA FILE CONVERSION, OR, WHERE WAS THIS GUY WHEN WE WERE ON DEADLINE?

The Creative Tools article on the Video Toaster (Issue #82/83) was a good sight to see. The article was upbeat and a good example of what can be done on an Amiga without the necessity of expensive hardware unobtainable by most.

What I objected to was what was at the tail end of the article: "...because while it's become a fairly routine matter to translate PC graphics into our Mac layouts, the Amiga sits off in a relatively isolated universe, and there is nothing on the premises that will read an Amiga disk" reads one portion of a paragraph; later, "the Toaster wizards had no means of converting their files into those [PICT, TIFF, EPSF] formats."

The "Toaster Wizards" have *every* means to convert framestore files to the Amiga's long-standing IFF standard through ToasterPaint. (LightWave can also save directly to the IFF standard.) From there, 24-bit image processing software such as Art Development Professional by ASDG Inc., or RasterLink by Active Circuits, Inc., would *easily* convert to and from IFF, TIFF, GIF, PCX, PostScript, and many other formats.

The only remaining issue is getting the newly converted files to your Mac. Using a modem would be the easiest, but other alternatives exist. MAC-2-DOS by Central Coast Software provides a method of file transfers to and from Mac-formatted floppies with a Mac compatible drive. You can even emulate a Mac on an Amiga with A-MAX II by ReadySoft, Inc. Using CrossDos by Consultron or DOS-2-DOS by Central Coast Software allows file copying between IBM PC 3.5" and 5.25" floppies. With the advanced multitasking abilities of the Amiga, you could do everything you needed to do without having to quit any application (memory permitting). Also, ToasterPaint and ARt Department Professional, as well as RasterLink, have ARexx ports (ARexx is an interprocess communication language by William Hawes and is not part of AmigaDOS 2.0), so scripts can be written to allow for easy and completely automated conversions.

To an everyday Amiga user, doing file conversions and file copying from Mac or PC formatted floppies couldn't be more routine, and has been routine for some time. The Amiga has more tools than most people realize. Discovering Amiga dealers, reading Amiga based magazines, attending local Amiga user group meetings, or calling Amiga-oriented bulletin boards or services such as CompuServe, BIX, and PeopleLink are ways of meeting the right people who can point you to the right tools. The Amiga is *not* isolated by *any* means.

Do keep Amiga articles going. There are plenty of people out there that are doing interesting things on their systems.

Daniel J. McCoy
Van Nuys

Letters are heartily encouraged. Send US Mail to Letters, MicroTimes, 3470 Buskirk Ave., Pleasant Hill, CA 94523. You can also reach us by fax at (415)934-2417, and by electronic mail—our Internet address is microx@well.sf.ca.us, and our MCI address is MICROTIMES.

CORRECTION

In last issue's article, "Win-Win: Paid Support For Free Software" by Brock N. Meeks, we printed incorrect contact information for Palo Alto-based Cygnus Support, the subject of the story.

Cygnus's correct phone number is (415)322-3811; fax (415)322-3270; Internet info@cygnus.com.

We apologize to our readers, to Cygnus, and most of all to the very nice lady who got a whole lot of inexplicable phone calls as a result of this error. We're very sorry for the inconvenience to all concerned.

—eds.

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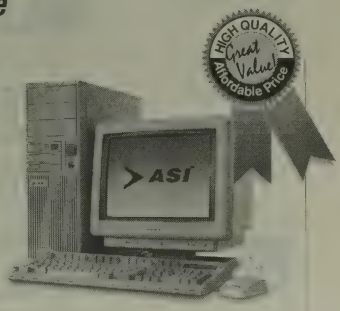

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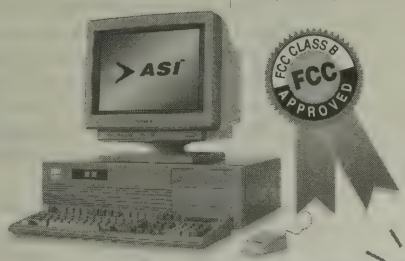

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INDUSTRY INSIGHT

Apple And IBM Agreement: Hot News Or Ho-Hum?

BY PAUL HOFFMAN

In what might appear to be a major announcement, Apple and IBM have agreed to share technologies and even form a joint venture company to help reduce Microsoft's importance in the 1990s.

The agreement had been widely rumored for weeks before the official announcement, although many of the reports had overstated the extent of the agreement. Apple and IBM had even set a date for the announcement, then cancelled, due to last-minute negotiations on the wording of the broad agreement.

After the announcement was made, both the regular press and the computer press fell all over themselves to make the agreement look like the biggest thing that had ever happened in the computer industry.

There were few specifics in the announcement, and many industry observers noted that Apple had earlier made such announcements with Digital Equipment Corporation (DEC), and that very little had come of them. However, IBM is not DEC, and Apple is now more in need of industry partners than it was a few years ago.

Still, there is a strong chance that neither IBM nor Apple users will ever see significant results if the two sides end up not marketing products derived from the agreement.

As the press gushed about the possibilities, they overlooked some glaring problems that could make the agreement not worth the ink used on it.

First, what is the chance that Apple employees will open their arms to a bunch of IBM suits? Or vice versa? The amount of animosity in the rank and file of both companies could easily make the agreement be one that never gets beyond the executive suite. Also, IBM is not offering Apple anything that Apple couldn't create for itself or buy for a few million dollars. It looks like the purpose of the agreement is to generate positive feelings about the two companies without having to produce much technology to back it up.

The five areas of the agreement include object-oriented software, networking, Macintosh programs running under AIX, future RISC-based systems, and multimedia. Of these, the most likely to produce products in the next two years are object-oriented software and multimedia.

OBJECT-ORIENTED SOFTWARE

Apple and IBM agreed to create a new company that will develop and market object servers and standards that will run on all computer systems, not just those from Apple and IBM. The idea behind the company is that an industry standard is necessary to make programming objects transportable from system to system.

If the effort is successful, computer users will be able to customize and extend their software easily, regardless of the system they use. The announcement made it clear that the products would work on all CPUs, not just those supported by IBM and Apple.

There are two possibilities here: Apple and IBM will either take the emerging standards of many compiler and programming houses and push them forward rapidly, or they will start their own "standard" and hope other people adhere to it. Given both companies' histories of proprietary systems, it's easy to believe that the new company might be as arrogant as its parents.

NETWORKING

This was a pretty ho-hum, "we'll try to work more closely" announcement. Apple has never worked very well on IBM networks and

If all that comes out of this is a stronger alliance between two of Microsoft's leading adversaries, that may be enough benefit to match the high cost of the projects that they will most certainly start.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

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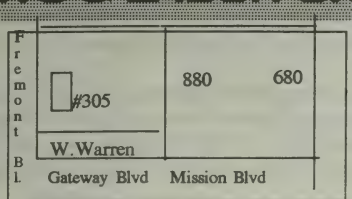

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IBM never really cared. Third-party manufacturers have been able to get Macs to work adequately, but never perfectly, on other systems. This could be easily fixed, but Apple has never quite made it in internetworking Macintoshes and could easily drop the ball again here.

MACINTOSH PROGRAMS RUNNING UNDER AIX

This is where most industry pundits guessed wrong during the negotiations. Instead of working together on a unified operating system, the announcement indicates that IBM's version of UNIX, AIX, will be modified to run "Macintosh and its thousands of user-oriented productivity applications."

Yeah, right. Almost any Macintosh developer will tell you that it's difficult enough to get Mac programs to work with a new version of the operating system on the 68000 series of CPUs. Imagine the incredible difficulty of getting these programs to work on both a new CPU and a hacked-up version of the operating system, and it seems likely that most developers will say "Why bother?" If Apple and IBM really want Mac programs to run on AIX systems, they should just put Mac boards into their UNIX boxes and do the interface mostly in hardware.

Although it's not stated in the agreement, it is likely that Apple will also use the AIX/Mac that IBM develops on the new RISC-based system that Apple will develop. This makes sense for Apple, since there is no reason to create two incompatible operating systems for supposedly compatible systems.

But anyone who has watched Apple and IBM over the past five years knows that neither company can resist changing a good thing and usually screwing it up just enough to frustrate the hell out of the users. The chance that a program will be able to work on AIX/Mac from IBM and AIX/Mac from Apple without at least recompilation (if not actual programming changes) is close to zero.

FUTURE RISC-BASED SYSTEMS

For people who know the current RISC market and Apple's current work, this was the most surprising part of the announcement. Apple has, in essence, committed to using a future version of IBM's RS/6000 RISC chip in a future computer.

Up to now, almost all of Apple's RISC effort had gone into the Motorola 88110, a chip much better suited for the next generation of Macintoshes than the RS/6000. The agreement says that Apple will use a future single-chip implementation of the RS/6000, manufactured by Motorola.

As the press gushed about the possibilities, they overlooked some glaring problems that could make the agreement not worth the ink used on it.

This switch in RISC bases at first looks like a big win for IBM, since it's currently the only company making systems based on the RS/6000. However, it could also be just a red herring on Apple's part. Apple has done so poorly in UNIX workstations with its A/UX operating system (a version of UNIX) that it may have decided that it only needs to *look* committed to a new platform without actually spending much money on implementation.

It will be at least two years before IBM and Motorola can redesign, test, and fabricate IBM's current five-chip design into the single chip specified in the document, possibly longer. For Apple to wait that long to get into the next generation of Macintosh indicates that it is not really much of a priority.

Further, the RS/6000 is not a good match for the current Macintosh software. As Michael Slater states in a recent issue of *Microprocessor Report*, the RS/6000 is designed to optimize floating-point number performance, but most Macintosh applications are dominated by integer math. Although the RS/6000 has a superscaler design, that doesn't help integer-only applications much. "In the future," wrote Slater, "3-D graphics and other applications may increase the need for high-performance floating-point, but it nevertheless seems odd to choose an architecture designed with this as a key goal."

MULTIMEDIA

How many different multimedia strategies can IBM juggle? Let's find out.

The agreement calls for IBM and Apple "to work together to create and license plat-

Technology News From Japan

(Excerpted from the weekly news digest of Japan Marketing Group, 400 Groveland Ave., Suite 312, Minneapolis, MN 55403, 612/871-7889. JMG covers products and events in the Japanese computer industry.)

➤Sony and Nintendo have reached an agreement to convert 16-bit Nintendo video game software to run on the Sony Playstation CD-I player. The Playstation will be released in Japan this fall and in the US next spring.

Sony will develop more than ten games based on characters in movies from Columbia Pictures, which was purchased by Sony. This marks Sony's first entry into the home video game market and the first major agreement with Nintendo.

➤Sega, a competitor of Nintendo, will team up with Daiwa Securities, one of Japan's top four stock brokers, to convert Sega's 16-bit MegaDrive home game machine into a Daiwa "My Trade" terminal. The bank will then market the drive through its branches throughout Japan. The terminal will cost about $300 and will allow Daiwa customers to trade stocks and bonds.

Daiwa is closely associated with Sumitomo Bank, so the terminal may later allow people with accounts at Sumitomo banks to access their accounts from home as well. Sega will also try to sell the terminal to other security firms.

➤Dataquest Japan released a report saying that American PC makers' market share in Japan is near 20%. The two major American shares were IBM Japan (13%) and Apple Japan (4%). The other 80% is comprised of NEC (44%), Toshiba (11%), Fujitsu (8%), Seiko-Epson (5%), and other smaller companies.

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386-SX 20 MHz Notebooks!

- 2 Meg Expandable to 16 MB
- Lightest: 6.4 lbs

40 Meg Hard Disk $2280
60 Meg Hard Disk $2650

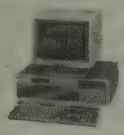
Everex Tempo SX-16/20

- 1 MB expandable to 5 MB
- 21 MB IDE Hard Disk (25ms)
- 10" Diagonal LCD w/CDF Backlight
- VGA 640x480 (16 gray shades)
- External VGA Port
- 1 Serial/1 Parallel Port
- Size: 2"x12"x10"
- Weighs less than 7 lbs including battery
- Supports: DOS, Windows 3.0, OS/2, Xenix

SX-16 **$2235** SX-20 **CALL**

486-25 MHz System

- 64K Cache
- 1 MB Expandable to 16 MB
- Landmark=115
- BIO Shadow RAM
- Supports External Weitek
- Teac 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave FD/HD Controller
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply

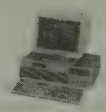


$1250

33 MHz $1380

386-33 MHz 64K Cache System

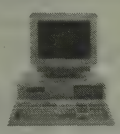
- 1 MB Expandable to 32 MB on Board
- C & T Chip Set
- 64K Cache Memory Exp. to 256K
- TEAC 1.2 MB or 1.44 MB Floppy Drive
- 1:1 Interleave FD/HD Controller
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



$695

386-25 MHz System

- 1 MB RAM on board
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy Drive
- Serial, Parallel, Game Port
- 101 Keyboard
- Case w/Power Supply



$595

386-SX 16 MHz System

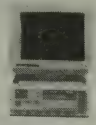
- Intel 386-SX CPU
- 1 MB RAM on board, Landmark=21.6
- AMI BIOS
- EMS-LIM 4.0 on Board
- Hard/Floppy Controller (1:1)
- Teac 1.2 MB or 1.44 MB Floppy
- Serial, Parallel, Game Port
- 101 Keyboard
- Choice: Regular Baby Case or Small Vertical Case

$475

20 MHz. $515

286-12 MHz System

- 512K RAM Exp. to 4MB
- 1.2 MB or 1.44 MB Floppy Drive
- C&T Chip Set
- Ems 4.0 & Shadow Ram
- 1:1 Interleave HD/FD Controller
- 101 Keyboard
- Choice: Regular Case, Baby Case or Small Vertical Case



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20 MHz. $350

12 MHz XT System - CALL

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Western Digital 40 MB 175
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Conner 200 MB. 620
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Fujitsu 135 MB. 450
Toshiba 100 Meg IDE 380

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Everex 2400 Baud MNP5 (ext) . 195
Everex 2400 Baud MNP5 (int) . 150
Everex 2400B (ext) 165
Everex Fax Modem (int) 255
Pocket Modem . . . . . CALL
9600 Baud Modem . . . . . CALL
Ext 2400 Baud Modem. 98
Int. 2400 Baud Modem. 65

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Panasonic KX-1124/1123 255
Panasonic KX-1524 375
Panasonic KX-1624 375
Panasonic KX-4420 Laser 890
Citizen GSX 140/Color . . . 280/330
Citizen GX 200/Color 165/215

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XT-12 MHz
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Super VGA (0.28-1024x768). . . 315
Multisync (Relisys). 420
NEC 2A/3D 495/610

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XT Multi I/O 39
Floppy Controller (360, 720, 1.2, 1.44K) 35
Floppy Controller (360K). 16
XT-H/D Controller WD-Gen. . . . 50
DTC 7280 MFM FD/HD (1:1) . . . 75
DTC 7287 RLL FD/HD (1:1) 85
Printer/Serial/Game 18
Everex RAM 3000 Deluxe 89
Everex RAM 10000 158

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Teac 720K/1.44K 65/65

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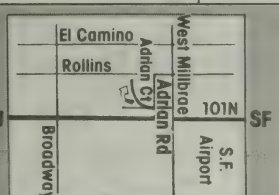

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form-independent software environments that will stimulate widespread industry development of this new technology."

Ain't that grand? Isn't that what every other multimedia agreement to date has been about?

IBM stands to gain much more from Apple here, although Apple can get some free credibility for the work it's done in the area. Most likely, Apple will license its new QuickTime platform for coordinating the parts of multimedia such as sound, still pictures, and animation. In return, more people will use QuickTime on more platforms and Apple will be able to point to it and show off.

WHAT TO EXPECT

Of course, they may decide to do nothing or just drag out the agreement until people forget about it, as with the Apple-DEC agreement. If all that comes out of this is a stronger alliance between two of Microsoft's leading adversaries, that may be enough benefit to match the high cost of the projects that they will most certainly start.

Given that Apple and IBM are becoming increasingly adversarial with Microsoft, it's unlikely that their object-oriented technology will be blessed by Bill Gates. Therefore, it may not end up being of any value to the largest number of computer users, those who rely on MS-DOS and Windows.

Only a small number of people would get much benefit from the product that's getting most of the publicity: the Apple RS/6000 workstation. These will be very expensive and not necessarily useful machines. If Apple is able to get QuickTime to work well, IBM's use of it would have a much wider effect on more people than on all of the other parts of the agreement combined.

NCR NOTEPAD: PEN COMPUTING FOR THE MASSES?

NCR, now part of AT&T after the conclusion of the most public merger battle in the computer industry, is the first significant player in the pen-based notebook race. Its recently announced system, with the colorful name "Model 3125", should be in the stores in August at a price around $4,800 including the operating system.

Since NCR is essentially the first out with such a system, it's avoiding choosing the "wrong" operating system by giving the buyer the choice—either Microsoft's Windows for Pen Computing or GO's PenPoint.

NCR decided to be first in this new field (following GRiD's fairly unsuccessful entry many years ago) for many reasons. Many established NCR customers, such as insurance companies and heavy manufacturing, are the prime targets for pen-based computing. Pen-based computers are primarily aimed at people who do not spend much time entering data into the computer, but instead navigate through screens of information based on what they entered. They compete directly with laptops, at least on size and weight. If other manufacturers meet NCR's pricing, pen-based notebooks should cost around the same as standard laptop systems or be within about 25% of their price.

Since NCR is essentially the first out with such a system, it's avoiding choosing the "wrong" operating system by giving the buyer the choice—either Microsoft's Windows for Pen Computing or GO's PenPoint.

The 3125 comes with a 20MB hard disk, although you can also get a version that has a 2MB Flash EPROM instead of a hard disk if you want greater reliability at the expense of much disk storage. The 80386SL CPU runs at 20MHz, making it significantly faster than the current crop of 80386SX laptop computers. Most applications, after being translated for the appropriate pen operating system, will run very quickly on the 3125.

NCR is taking a fairly hefty risk with the 3125. Since the price of laptops is still dropping quickly, there will probably be a significant gap in the prices between the two types

MicroTimes Financial Barometer:

In this issue of MicroTimes, we introduce a stock market feature which we believe will be of great value to you, our readers. Compiled by Nordby International, providers of customized financial features to the world's business press, this barometer will monitor monthly the business climate of publicly held computing concerns.

This feature employs some unique concepts which will allow us to extract pertinent data on the financial health of our industry.

First of all, Nordby International has developed a MicroTimes Stock Index, which represents the collective performance of the companies in the accompanying table. This index is in turn compared to the Dow Jones Industrial Average to see exactly how they stacked up during the period. In other words, the individual performances of the computing stocks can be seen in the company-by-company table, while the performance of the portfolio is viewed through the MicroTimes Stock Index.

Secondly, Nordby will provide a market diary, which recaps the vital statistics from the tables and graphs into a capsule format for easy review of the past month's activity. This section monitors the most active issues during the 30-day period in conjunction with an index summary which compares the performance of the MicroTimes Stock Index vis-a-vis a number of national indicators.

Thirdly, starting next month, Nordby International will provide analysis on the companies in the accompanying stock table. This commentary will focus on what happened to the individual stocks in our sector during the previous month, and the impact these stocks had on the overall performance of the MicroTimes Stock Index.

EXCH	COMPANY	TICKER SYMBOL	CLOSING PRICE 06/05/91	CLOSING PRICE 07/05/91	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	PRICE/ EARNINGS RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	52 WEEK HIGH	52 WEEK LOW
				CPUs							
NYS	Advanced Micro Devices	AMD	13.50	11.38	-2.13	15.74	-13	0.00	0.00	14.25	3.63
OTC	Intel	INTC	53.75	42.88	-10.88	-20.23	13	0.00	0.00	59.25	28.00
NYS	LSI Logic	LSI	9.88	7.88	-2.00	-20.25	-10	0.00	0.00	13.00	5.13
OTC	MIPS	MIPS	16.13	15.00	-1.13	-6.98	94	0.00	0.00	20.88	7.25
NYS	Motorola	MOT	68.63	65.50	-3.13	-4.55	18	0.76	1.16	88.25	45.75

Continued

486 33MHz SYSTEM

- AMI BIOS
- IDE Controller
- Teac 1.2 MB or 1.44 MB Drive
- 1 MB Expandable to 32 MB Drive
- 8K Byte Cache & Floating Point Unit
- **64K Second Level Cache**
- Maxi-Switch 101 Keyboard
- 2 Serial/1 Parallel

$1205

128K Cache **$1325**

486 25MHz SYSTEM

- AMI BIOS
- IDE Controller
- Teac 1.2 MB or 1.44 MB Drive
- 1 MB Expandable
- 8K Byte Cache & Floating Point Unit
- **128K Second Level Cache**
- Maxi-Switch 101 Keyboard
- 2 Serial/1 Parallel

$1125

386 40MHz 64K CACHE SYSTEM

- AMI BIOS
- IDE Controller
- Teac 1.2 MB or 1.44 MB Drive
- 80387 Socket
- 1 MB Memory Exp To 32 MB
- 64K Cache Expandable
- Landmark 65
- 2 Serial/1 Parallel/1 Game Ports
- Maxi-Switch 101 Keyboard

$885

33 MHz **$685**

386 25MHz SYSTEM

- AMI BIOS
- IDE Controller
- Teac 1.2 or 1.44 MB Floppy
- 80387 Socket
- 1 MB on Board Expandable To 8 MB
- 2 Serial/1 Parallel/1 Game
- Landmark 28 MHz
- Maxiswitch 101 Keyboard

$575

ECS Motherboard **$645**

16MHz 386SX SYSTEM

- 16 MHz 386SX Motherboard
- 1 MB RAM Up To 8 MB
- 1:2 MB or 1.44 MB Drive
- IDE Controller
- 220W P/S
- Intel Chip Set
- 101 Style Keyboard
- 2 Serial/1 Parallel

$465

20 MHz **$495**

8/12MHz 286 SYSTEM

- 512K RAM Exp To 4 MB On Board
- 1:2 MB or 1.44 MB Drive
- IDE Controller
- 220W Power Supply
- 101 Keyboard
- One Year Warranty
- 2 Serial/1 Parallel

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$325 286-16 MHz

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ARCNET CARD 16 BIT (BUS)	95

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ORCHID PRO-DESIGNER II (1024x768x256)	$195
VGA Tseng Chip Set 1 MB	135
EVEREX EGA (640x480)	59
GENOA VGA 6300 (1024x768) w/512K Non-Interleave	95
TRIDENT VGA (1024x768) 256K exp to 1 MB	$79
PARADISE VGA (16 Bit OEM) 1024x768	$75
OTI VGA 800x600	59
GENERIC Monochrome Graphics w/Printer Port	19
Color Graphics Card/Printer Port	35

DRIVE CONTROLLERS

Floppy Controller	$16
Hard disk controller XT	48
DTC 7280 MFM Contrl (1:1 Inter)	75
DTC 7287 RLL Contrl (1:1 Inter)	85
DTC 3280 SCSI	125
DTC 6280 ESDI (1:1 Inter)	125
DTK Floppy Controller (DTK) 360/1.2/720 1.44 MB	$35
Ultrastore ESDI 32K Cache	169
IDE Controller	25

I/O CARDS

RS-232 card	$17
AT-I/O card (S/P/G) DTK	35
AT-I/O (2S/1P/1G)	20
Multi I/O (FDD/S/P/G/Clock)	39
Printer Card	18
Clock Card	19
Game Card	19

MEMORY EXPANSION CARDS

Everex 10 MB RAM card	$135
Everex 3 MB RAM card	84
Everex 8 MB RAM card (LIM 4.0)	189

MONITORS

NANAO 9070U 16" 0.28 mm	$995
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V5 (Trinitron tube) Sony 1304 Equiv	545
V4 1024x768 VGA	345
V3 1024x768 Multisync	475
V2 640x480 .29 dot pitch	325
SUPERTRON 1024x768 VGA .28	319
KFC Super VGA 1024x768 .28	299
RELISYS 9513 (VGA)	310
9514 (1024x768)	335
9503 VGA Mono	139
NEC 5D	2355
4D	975
3D Multisync	625
SUPERTRON 14" Flat Screen (Amber or Paper White)	95
12" Amber Mono	75
SEIKO 2050 (1280x1024) Non-Inter w/ProDesigner II	1945
SONY 1304 Non-Int (1024x768)	595

KEYBOARDS

Quotronix 101	$35
Lite-On 101	37
Keytronic 101	46
Mitsumi 101	39
Chicony 5161 101 Keyboard (clicking)	48
MAXISWITCH 101 Keyboard	39
101 Baby Keyboard	37

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SEAGATE ST-225 (20 MB)	189
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MAXTOR LXT-200 SCSI	755
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TEAC 40 MB IDE 23ms. (Super Quiet, Low Defect Rate 0.2% - Managers Choice)	209

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Tape Back-Up 250 MB	345
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TF-120 Tape Cartridge	28

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486 33 MHz w/o CPU w/128K Cache	$545
486 25 MHz w/o CPU w/128K Cache	485
386 25 MHz (w/CPU)	365
386-25C (64K Cache) w/CPU	395
386 25 MHz (w/CPU) ECS	455
386-33C (64K Cache) w/CPU	455
386-40 (64K Cache) w/CPU	655
386 20 SX	275
386-16SX MB	240
286 16 MHz	115
8/12 MHz 0 Wait 286 MB	88

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14" Baby AT Case w/200W P/S	99
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Medium Vertical Case	135
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Logitech Trackman (Ser/Bus)	$79/85
Logitech Scanman 32 Scale (Scanman Plus)	165
Logitech Serial Mouseman	66
Logitech Bus Mouseman	75
Mouse (Serial 9 Pin)	25

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Panasonic KXP-1624 132 Column	CALL
KXP-1180 w/Cable	$159
KXP-1123	239
KXP-1124	295

MISC.

Public Domain Software	$2.99 disk
MS DOS 3.3/4.01	65
6' printer cable	3.50
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Keyboard Extension cable	5
Monitor Extension cable	5
Keyboard drawer	27
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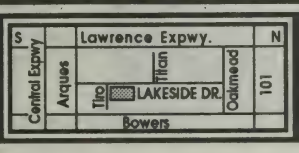

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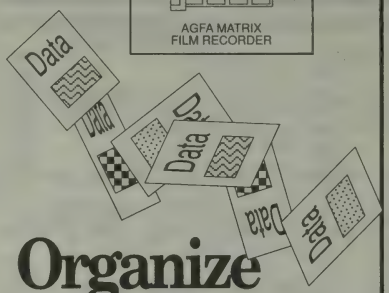

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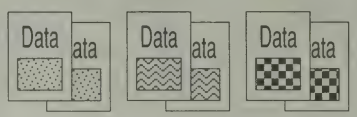

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of systems by the end of the year. Unless people feel that there are big advantages to pen-based computing, these systems could be no more popular than GRiD's first foray into the market.

The main advantage of pen-based computers seems to be ease of use through the operating system. But Microsoft's Windows for Pen Computing is only as easy (or just as difficult) to use as regular Windows without a keyboard. And even the slowest hunt-and-peck typist can enter text at the same rate (and more accurately) than writing on the screen. Since pen-based computers aren't that much smaller or lighter, they do not offer significant advantages that cannot be built into a laptop with a mouse or mouse-like device built in. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 06/05/91	CLOSING PRICE 07/05/91	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	PRICE/ EARNINGS RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	52 WEEK HIGH	52 WEEK LOW
SOFTWARE												
NYS	Adobe	(L)	ADB	8.00	6.88	-1.13	-14.06	-10	0.00	0.00	14.50	6.75
OTC	Aldus		ALDC	46.75	37.75	-9.00	-19.25	21	0.00	0.00	59.88	20.25
OTC	Ashton-Tate		TATE	10.25	10.38	0.13	1.22	-20	0.00	0.00	13.25	4.88
OTC	Autodesk	(H)	ACAD	58.25	47.00	-11.25	-19.31	20	0.48	1.02	62.25	32.00
OTC	Borland		BORL	54.75	44.13	-10.63	-19.41	25	0.00	0.00	64.25	14.50
OTC	Informix		IFMX	5.75	5.75	0.00	0.00	-4	0.00	0.00	17.50	2.63
OTC	Lotus		LOTS	33.50	32.25	-1.25	-3.73	215	0.00	0.00	36.50	12.50
OTC	Microsoft	(H)	MSFT	74.66	61.75	-12.91	-17.29	29	0.00	0.00	78.38	33.88
OTC	Novell		NOVL	54.75	48.50	-6.25	-11.42	27	0.00	0.00	58.50	17.25
OTC	Oracle		ORCL	9.63	8.13	-1.50	-15.58	29	0.00	0.00	22.88	4.88
OTC	Software Publishing		SPCO	20.00	14.00	-6.00	-30.00	11	0.00	0.00	35.25	12.00
OTC	Symantec		SYMC	44.50	44.00	-0.50	-1.12	48	0.00	0.00	55.88	17.75
HARDWARE												
OTC	Apple		AAPL	48.00	45.63	-2.38	-4.95	11	0.48	1.11	73.25	24.25
OTC	AST Research		ASTA	22.63	20.75	-1.88	-8.29	10	0.00	0.00	32.75	7.50
NYS	Commodore		CBU	16.50	12.38	-4.13	-25.00	8	0.00	0.00	21.63	4.50
NYS	Compaq	(L)	CPQ	37.13	33.25	-3.88	-10.44	6	0.00	0.00	74.25	29.88
NYS	Digital Equipment		DEC	67.00	59.63	-7.38	-11.01	-	0.00	0.00	86.88	45.50
OTC	Dell		DELL	25.75	26.13	0.38	1.46	17	0.00	0.00	30.63	8.25
NYS	Hewlett-Packard		HWP	54.00	50.75	-3.25	-6.02	15	0.48	0.95	55.13	24.88
NYS	IBM		IBM	103.25	98.63	-4.63	-4.48	10	4.84	4.91	139.75	96.25
NYS	Silicon Graphics		SGI	33.25	28.75	-5.25	-15.79	18	0.00	0.00	47.25	18.00
OTC	Sun Microsystems		SUNW	36.50	25.88	-10.63	29.11	15	0.00	0.00	38.63	15.00
NYS	Xerox		XRX	56.50	53.88	-2.63	-4.65	9	3.00	5.57	60.13	29.00
NYS	Tandy		TAN	34.13	27.50	-6.63	-19.41	9	0.60	2.18	39.50	23.50
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NYS	AT&T		T	36.50	38.88	2.38	6.51	15	1.32	3.40	39.75	29.00
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OTC	MCI		MCIC	30.25	28.50	-1.75	-5.79	31	0.10	0.35	41.63	17.88
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NEW LOWS	3	SMALLEST PERCENTAGE GAINER	Software Publishing -30.00%

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DOW JONES INDUSTRIAL AVERAGE	3005.37	2932.47	-72.90	-2.43
STANDARD & POOR'S 500 STOCK INDEX	370.94	374.08	3.14	0.85
N.Y.S.E. COMPOSITE	210.88	204.92	-5.96	-2.83
NASDAQ COMPOSITE	505.20	474.05	-31.15	-6.17

DATE	MICRO TIMES	DOW JONES
12/05/90	2938.43	2610.40
01/04/91	3386.69	2566.09
02/05/91	3586.83	2788.37
03/05/91	3531.96	2972.52
04/05/91	3298.59	2896.78
05/06/91	3209.84	2941.64
06/05/91	3178.90	3005.37
07/05/91	2850.09	2932.47

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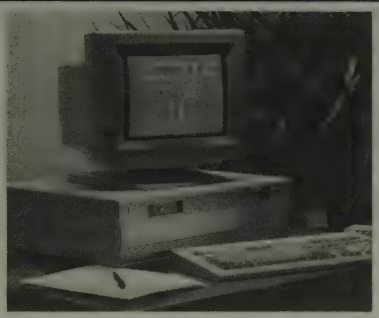

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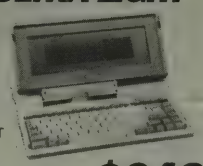

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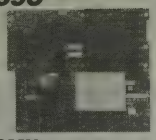

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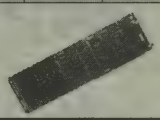

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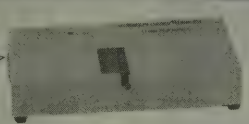

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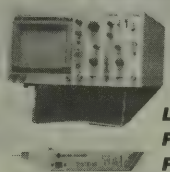

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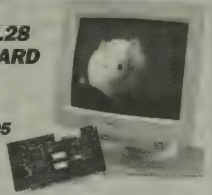

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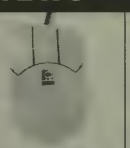

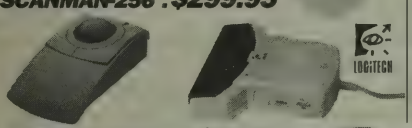

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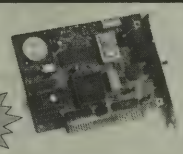

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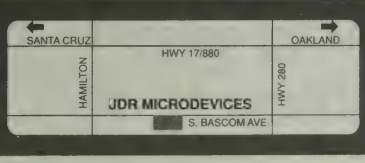

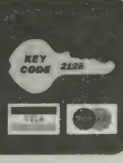

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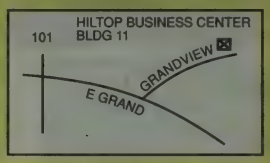

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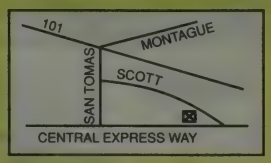

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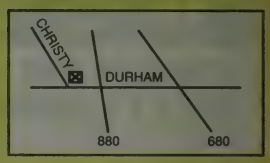

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Cursors, Awards & Surveillance

Interface Improvements, Apple's Missing Upgrades, Universal Citizen-Tracking, And Other Scenarios

BY JIM WARREN

This is a "how to do it" column for those wishing to build—or avoid—the future.

CURSOR UTOPIA

Let's have the option of expanding a rectangular area around the cursor, upon command. Such point-'n'-click magnification would aid editing large documents and/or small type. John Nagle mentioned this and said he saw it, long ago, at Xerox Palo Alto Research Center—from which numerous Mac design principles derived.

REALIZABLE FANTASIES

Of course, the rectangle would move with the cursor—like a magnifying glass. And the rectangle size and shape should be user-definable by click-'n'-drag—prompting entertaining point versus meta-point concepts.

APPLE EARNS ANTI-AWARD

Does this reflect Apple's plans for our future?

Apple refuses to offer a 32-bit upgrade path for its older Macs. Aside from being sleazy customer support, this is contrary to statements in some older Mac manuals—page 88 of the IIcx manual, for instance, says that memory is "expandable to 128MB when SIMMs with higher-density DRAM chips become available." Of *course* you can expand—if you rebuild your Mac and don't use most Mac software. (*MacWeek* and *MacWorld* articles prompted these comments.)

Further, their System 7 license says you can't decompile it, loan it, rent it, take it out of the country, base derivative works on it, make more than one backup copy, or install it on a clone. So, don't let MacNosy trace a bug into System 7. Don't put it on a Mac you may loan to someone, or one you might rent, or one you might take on a trip. Don't develop any programs deriving from it, or let your automatic backup create more than one copy. (noted by John Nagle)

IBM lost its "no clones" prohibitions. If it's legal, watch Apple prohibit using System 7 with other manufacturers' disks, Ford prohibit installing their engines in non-Ford hot rods, and Macy's prohibit wearing their pants with Emporium shirts.

FOREIGN SURVEILLANCE

Arms sales may be decreasing, but we are exporting an exciting new technology—government surveillance.

The second annual Smithsonian-*ComputerWorld* Award for innovative information technology in the governmental sector went last year to the Thailand Ministry of Interior for its citizen database system, the largest in the world. It tracks and cross-references data on 55 million citizens. Thais are assigned a "Population Identification Number" and are required to carry a computer-readable ID card that includes photo, thumbprint, and personal data.

The system will include ancestral history and family makeup. Among other things, it is designed to track voting patterns, domestic and foreign travel, and social welfare. Twelve thousand government agents will have networked access. The director of the Central Population Database Center was quoted as saying, "The people feel this system will protect them."

Our government-funded Smithsonian and our largest dinosaur-computer trade rag judged it to be the best government system in the world. Two of the three judges have major computer responsibilities in the US government. (Based on an article in *The Privacy Journal*, Box 28577, Providence RI 02908, $35/year.)

Privacy International founder Simon Davies commented on the Smithsonian-*ComputerWorld* award at the Computers, Freedom & Privacy Conference (CFP) last March. He said that, when he tried to encourage privacy protection in Thai and other Far East nations, they

Apple's System 7 license says you can't decompile it, loan it, rent it, take it out of the country, base derivative works on it, make more than one backup copy or install it on a clone. So don't let MacNosy trace a bug into System 7. Don't put it on a Mac you may loan to someone, or one you might rent, or one you might take on a trip.

Copyright © 1991 by Jim Warren. All rights reserved. *Jim Warren organized and Chaired the recent First Conference on Computers, Freedom & Privacy, sponsored by a dozen organizations. He founded* InfoWorld, *the DataCast proposal for paperless electronic newspaper, Wireless Digital, Initiative, Inc. and one of the nation's largest public microcomputer conventions. He was founding host of PBS's "Computer Chronicles", founding editor of* Dr. Dobb's Journal, *and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

repeatedly referenced the Smithsonian-*ComputerWorld* award as evidence that the United States thought their system was outstanding.

HOME SURVEILLANCE

The Thais won't be ahead of us for long. FBI Assistant Director William "Al" Bayse—in charge of the Bureau's National Crime Information Center (NCIC)—outlined the FBI's plans for NCIC-2000, to be completed in the next few years (also speaking at CFP).

He said the FBI plans to include a convenience for patrol officers around the nation to use when they stop someone on the street. The officer, "at the patrol-car level, will be able to take a video image of the person for identification, as well as a fingerprint...and move that through the network...and do a match at the central repository of fingerprints and photographs." He added, "It's to your advantage to do this" (so you can drive on more quickly if the computer doesn't find anything on you—and makes no mistakes).

When asked what else the computer might do with the digitized image, he said, "It just goes away." When asked about local officers or agencies retaining the digitized images in a local database, he said, "It's supposed to get lost."

When asked if somebody could "enter the system by the radio frequency," he said, "But that's data transmission. What are they going to pick up? They're not going to get...audio. I don't know anybody that can demodulate the data off those police frequencies."

A chorus from the audience responded, *"We do!"*

(Tapes of the CFP sessions are available from Recording, Etc., 415/327-9344 in Palo Alto, 1-800-227-9980 outside California. Printed proceedings and videotapes are planned. If interested, drop me a note at the address in the sidebar.)

Thais are assigned a "Population Identification Number" and are required to carry a computer-readable ID card that includes photo, thumbprint, and personal data. The system will include ancestral history and family makeup.

QUICKIE

If Operation Desert Shield and Operation Desert Storm were to protect "our" oil, what's next? Perhaps increased demand for silicon chips and optic fiber "wires" will create a global silicon shortage. Thus, our next adventure might be Operation Sand Storm. (fantasized by Jay Thorwaldson)

SHARE WHERE? SHARE HERE!

Send *your* fantasies for realization to Jim Warren, Realizable Fantasies, 345 Swett Road, Woodside, CA 94062. Published proposals will be attributed to their authors unless anonymity is requested.■

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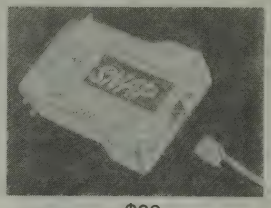

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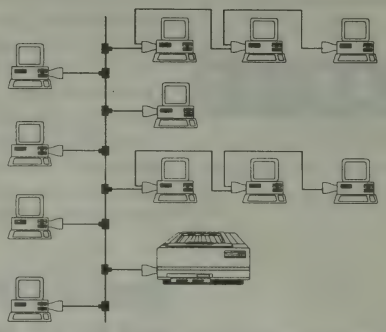

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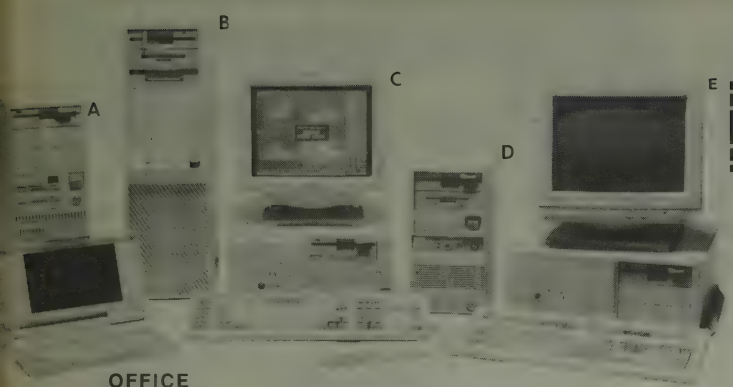

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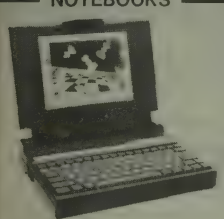

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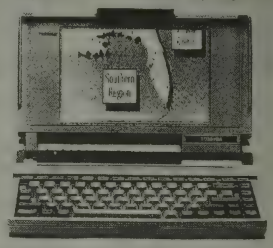

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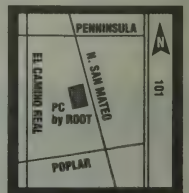

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LAN ACCOUNTING

Installing And Using A Local Area Network In An Accounting Firm

BY ADRIAN B. STERN

CPA firms have been using computers since they began using VisiCalc on Apple II computers. But, they have often lagged behind their clients in the implementation of local area networks (LANs). Our firm, Clumeck, Stern, Phillips & Schwartz, a mid-sized CPA firm located in Encino, CA, chose to break from this stereotype.

The installation of a local area network has been beneficial to every member of our organization. Prior to installation of the LAN, administrative personnel and some partners had computers in their offices, while the staff shared two computers in the office and two laptops in the field.

This environment created three major problems. First, data was extremely difficult to share. Tax returns would be copied, for example, to be adjusted on the hard disk of the second machine or directly on the floppy. Without stringent controls it was often difficult to locate the most current version of the data.

Second, it was not cost effective for each workstation to have its own local printer. The inability to share would cause a line at the fastest machine and printer, with everyone anxiously waiting to print their individual documents.

The third problem created was the inability to have timely, complete, and consistent backups. With nine machines, it was next to impossible to establish a regimented routine for backing up each machine.

THE INSTALLATION

These are the problems that led us to decide to install the LAN. Prior to installation, however, several steps were necessary. First, the hardware and software needed to be selected. The hardware selection involved analysis of individual users' needs as well as the available space. Our existing software was analyzed for its compatibility with other programs, its networking capabilities, user friendliness, and its value and usefulness to the firm as a whole.

Once the hardware and software decisions were made, a wiring contractor and Novell installation firm were chosen. Blueprints were marked showing the exact location of each node for the wiring contractor.

We installed a total of twenty-two nodes in the office, including private offices, conference rooms, and generally, wherever we felt someone might need to access information. Special areas were wired for using a laptop for making a large group presentation.

The best part of the installation was that the LAN was up and running in a single day. This included configuring the individual workstations and server; mapping locations of the system; programs; and data on the server; loading software to the server; creating group menus; loading data, and testing.

COMPUTER HARDWARE

The key to any successful network is a fast file server, a quality cabling job, and correctly installed and configured network boards.

We selected for our file server a 33MHz 386 processor with 4MB of RAM and a 320MB, 18ms hard disk. An uninterruptable power supply (UPS), tied in to the server with a Novell VAP, backed up the system. This configuration was selected for high performance at a reasonable cost. It was our feeling that selecting a 486 class processor would have accomplished only minor system performance increases in relation to the dollars spent. The system cabinet contains room for a second hard disk, for additional storage space, or for fault tolerant applications if we so desire. The motherboard also has room for an additional 4MB of memory in 1MB SIMMs.

Our workstations vary depending on the user they are assigned to. Our administrative staff use 386 tower configuration processors running at 25MHz with large, local drives and fast, local laser printers. These systems use Zenith flat-screen VGA monitors to reduce the glare from the fluorescent lighting

The best part of the installation was that the LAN was up and running in a single day. This included configuring the individual workstations and server, mapping locations of the system, programs, and data on the server; loading software to the server; creating group menus; loading data; and testing.

Adrian B. Stern is a CPA and partner in the accounting firm of Clumeck, Stern, Phillips & Schwartz in Encino, CA. In addition, he is an award-winning speaker and author for the California Society of CPAs.

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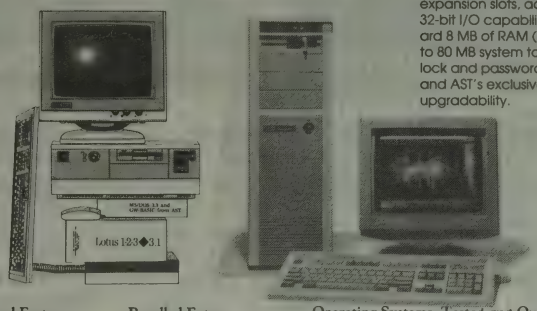

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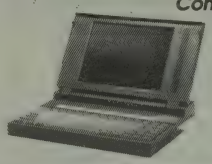

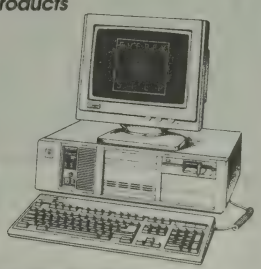

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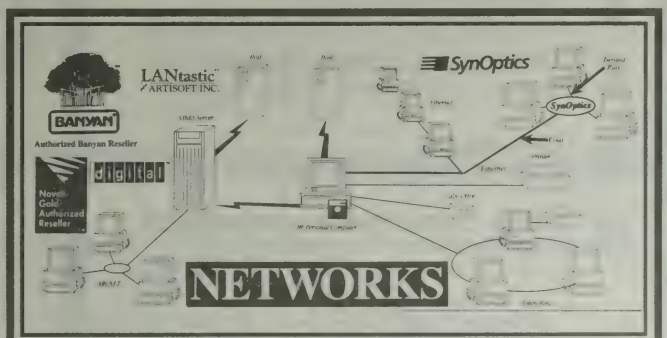

The ability to capture errant time was the key factor in justifying the cost of the LAN. We estimate that the system, from this one application, paid for itself within six months of its installation.

used in the office. Typically, an operator uses these machines eight hours per day making speed, printer availability, and operator comfort of utmost importance.

The accounting staff use 20MHz 386 processors in an ultra slim-line cabinet with standard VGA monitors. The advantages of these units are their size (2.5" high, 12" wide, and 15" deep) and the fact that, due to their construction, they require no internal fan, which greatly reduces their noise. The units contain 40MB hard disk drives with no floppy drive to prevent unauthorized additions or removals of information from the network.

The partners use 20MHz 386SX processors in mini tower configurations with standard VGA monitors. These units contain both 3.5" and 5.25" floppy drives in addition to a 40MB hard disk.

None of our existing workstations are configured with mice due to the lack of Windows applications for the CPA office environment and the high-speed typing abilities of the administrative staff.

PRINTERS: TYPE AND LOCATION

Like most LAN users, we face two problems with our printers—where to place them and who will use them. Our solution was to allocate a Hewlett-Packard LaserJet II as our network printer to be used by the partners and accounting staff. Each of the administrative stations has a local printer, one an HP LaserJet III and the other an HP LaserJet IIIsi.

We configured the HP LaserJet IIIsi as a local printer instead of a network printer due to the extremely high volume of material produced by that user. During our busy season of January through April, we produce in excess of seventy-five thousand pages of word processing and tax returns at that station.

BACKUP—THE KEY TO A GOOD NIGHT'S SLEEP

Previously the office backup policy was loosely enforced, if not nonexistent. When we did manage to back up, it was using floppies and FastBack Plus. While the software was more than sufficient, the use of floppies was cumbersome, time consuming, and difficult to restore lost or damaged data from. Therefore, when installing the network, we specified a high-speed, 250MB tape backup unit from Archive Corporation. We teamed this with backup utility software from QSV. The combination allows us to create macros to perform the backup automatically. The macros run each morning at 4am, performing either a complete or interim backup. The only operator action required is changing the tape daily.

NETWARE OPERATING SYSTEM

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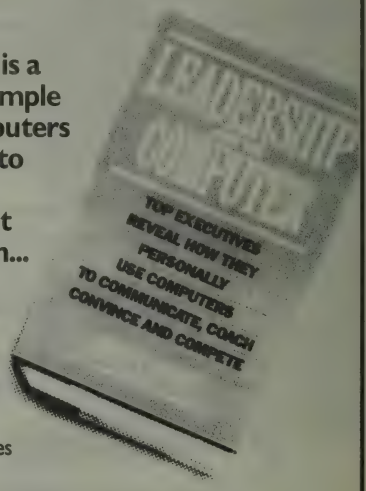
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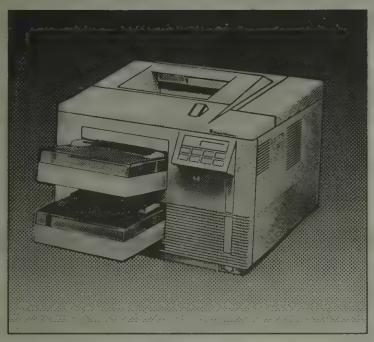

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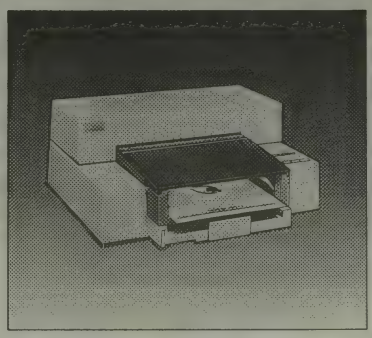

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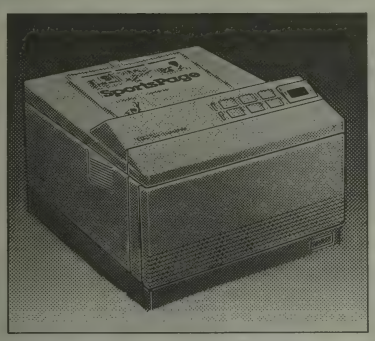

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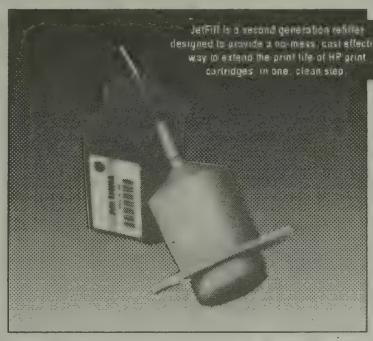
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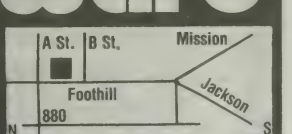

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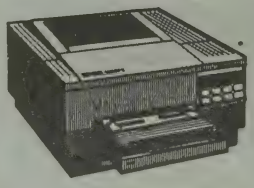

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chose NetWare 286 v2.15c for several major reasons, including the fact that in CPA firms Novell has an overwhelming share of the market in California. Many software packages, such as income tax processing and estate tax returns, come with assurances from the vendors that they will operate properly under Novell. In addition, we felt that the continued growth of our firm would outstrip the abilities of peer-to-peer networks like LanTastic. Finally, we chose to implement the Novell Menu System as a simple and fast way to allow our novice users easy access to the network. We rejected NetWare 386 as too expensive and not yielding substantial additional benefits for our particular installation. (With the change in the Novell pricing scheme, we intend to revisit this particular choice in the near future.)

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APPLICATION SOFTWARE: "TIME AND BILLING" AND WORD PROCESSING

The heart and soul of any professional firm is its ability to track, in laborious detail, the hours spent on each client. In the trade, these are called "time and billing" systems. The ability to capture errant time was the key factor in justifying the cost of the LAN. We estimate that the system, from this one application, paid for itself within six months of its installation. Our time and billing package is a RAM resident program that uses a hot-key to enter client name, description of the work done, and other pertinent information.

Word processing is the second most popular application on the LAN. We send out extensive amounts of reports, letters, and general correspondence every day. The ability to have multiple people with easy access to a document has made our office more productive.

EMAIL AND SPREADSHEETS

Electronic mail has also had a tremendous impact on our office productivity. Due to its RAM resident nature, email allows the administrative staff to take detailed, clear notes from clients while working on other applications. While partners and staff are on the phone, the ability to inform them that clients are holding facilitates the handling of multiple phone calls and provides a constant contact between the partners, accounting staff, and administrative staff.

Spreadsheets are a vital part of a CPA's practice. They have virtually replaced the columnar pad and pencil for most detailed calculations. Our office uses two packages: Lotus 1-2-3 v3.1 and Microsoft Excel v3.0. The complexity of each specific application dictates which package to use. Excel is used for three-dimensional and graphic intensive applications while Lotus is the choice for more extensive number crunching.

TAX SOFTWARE

In the tax projection and preparation areas, we employ several packages from three vendors. Due to the ever increasing complexity in personal tax law, it is no longer feasible, in most cases, to project the federal and state income taxes of an individual by using pencil and paper. Rather, the norm for most CPA firms is the use of highly

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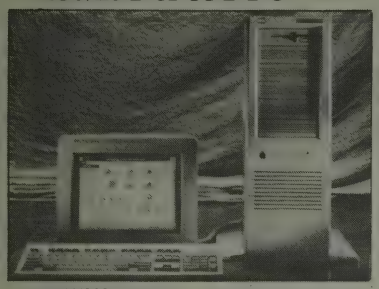

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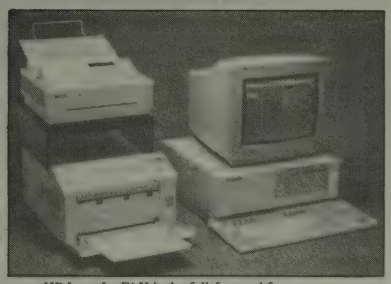

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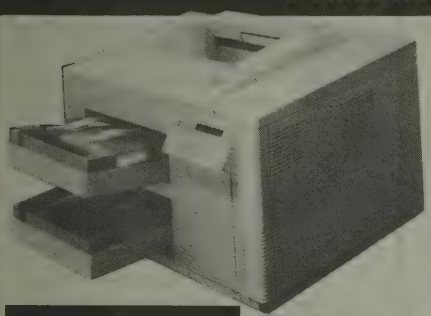

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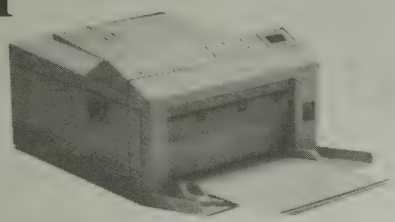

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sophisticated tax projection programs that allow detailed analysis of the components of income and expenses plus the ability to play "what if" games with these various components.

The most complicated software applications in our firm are the packages which produce individual, corporate, partnership and, fiduciary income tax returns. The software size on these applications ranges anywhere from 2-5MB and requires additional disk space for calculations. Therefore, our network and printer design was constructed to optimize the speed of calculating and printing these returns. In addition, we have found that these packages are extremely finicky about the config.sys file and the existence of RAM resident software packages. To help control this, we use QEMM 386 from Quarterdeck Office Systems to help maximize the available RAM and to optimize the system's files. We are currently experimenting with DOS 5.0 and QEMM 386 to continue this optimization trend. Our tax software also requires the use of tax font cartridges for the LaserJet printers. Our experience has shown that the only consistent output is obtained from HP printers and accessories. We have experimented with other laser printers and have continually found minor but recurring printer output problems.

Tax research is another important area of a CPA practice. We employ two types of this software. One package is an in-house online database, which contains most of the information for routine tax matters. The second package is an outside database that contains extensive tax information on court cases, tax rulings, regulations, and other related information. This combination of software gives us access to large amounts of up-to-date information at a fraction of the cost compared to having the information in our office in book format.

GENERAL LEDGER AND DEPRECIATION

Many CPA offices still do the basic service of preparing a general ledger and financial statements for its clients. Our LAN has made this process easier since all client data files are available to each user. No longer do we take the risk of misplacing the floppy disk containing all of the client's data. In addition, the ability to maintain extensive historical data on clients allows us to spot trends in their business.

With the advent of the 1986 federal tax act, it became almost impossible, without computerization, to maintain the various types of depreciation for each client. Many clients have four different depreciation types and lives for each asset. Our LAN gives us access to this data, as well as data integrity and preservation from the frequent backups.

SO, WHAT'S THE FINAL WORD?

Our experience in installing and maintaining our LAN has been a positive one. Fears that the project would become an endless money pit full of constant unexplained problems has proved unfounded. We spend very little time on its maintenance and continue to marvel at its speed and flexibility. The keys to our success have been to find and maintain an excellent relationship with a knowledgeable vendor and to experiment with new and different software products and ideas. Good riddance to sneaker-net! Alas, we knew it well. ■

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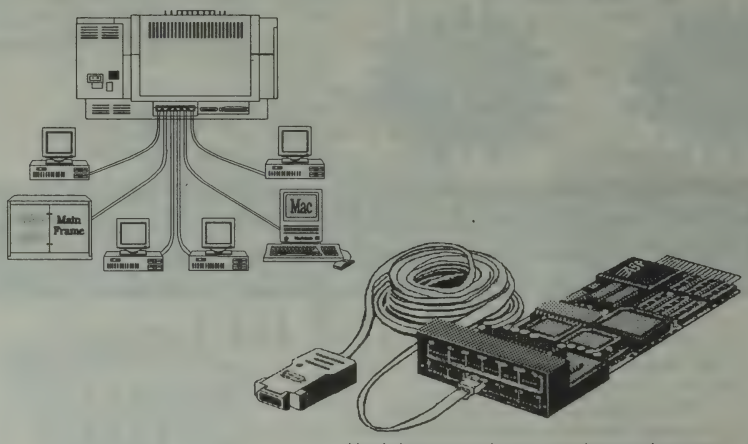

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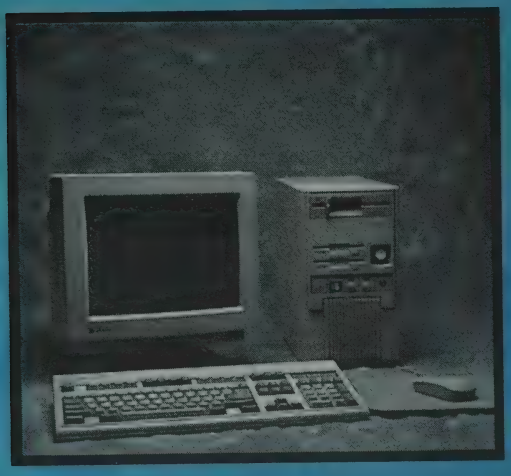

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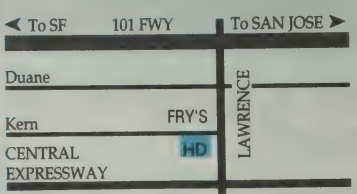

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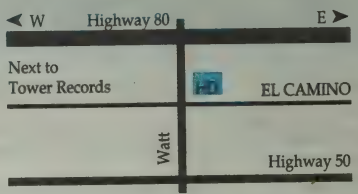

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New Options In LAN Printing

Plugging In A NewPort Print Server

BY MICHAEL ROBIN

During the 1980s, the standalone personal computer became standard equipment throughout offices in the United States. In the '90s, people have begun to connect their computers, building local area networks (LANs). By 1992, according to the Ganter Group, more than 65% of business PCs will be connected to a LAN, compared to 32% in 1988.

Like PCs a generation earlier, LANs are bringing new possibilities to businesses. LANs allow information to be easily shared, to quickly retrieve the single up-to-date version, and to regularly make a backup copy of everyone's work. As LANs become standard, almost necessary, equipment, our expectations for using them will continue to rise.

"If you think about how the user interacts with the network, besides their PC, probably the number one device they interface with is the printer," said Mark Christensen, product line manager for Intel Enhancements. Datek, a consulting service, estimates there are 3.5 million printers on networks in the US. By 1993, they predict the number of printers on networks will grow to 7.4 million.

Networked printers need to meet several requirements to be effective. First, they must be easy to install and maintain. Also, there must be minimal disruption to the user, and to the performance of the system. It must not compromise either the network or user's requirements for security. Finally, any solution must be affordable to ensure the optimal user-to-printer ratio.

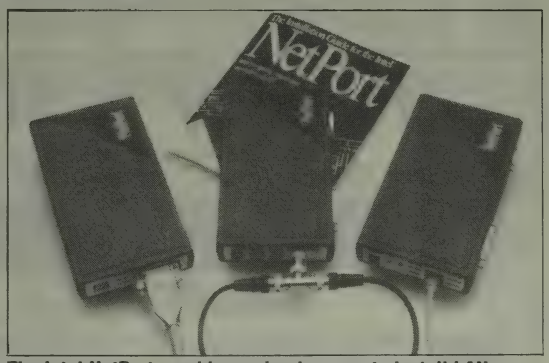
The specific uses and requirements from networked printers vary with the user's primary needs. General office workers and groups working together need to be close to a printer, while the financial and legal departments require confidentiality and security. Purchasing and billing departments usually need a dedicated printer for forms they regularly use. And LAN managers look for solutions that can facilitate the distribution of printers for these different uses.

PRINTING FROM A LAN

Traditionally, there have been two ways to configure printers on a network: connected to the file server or to the PC. Linked directly to a file server, by parallel or serial cables, usually places the printer away from the users, often in a closet with the server. Adding or relocating printers requires shutting down the system and installing a new cable, usually an expensive task.

Placing the printers down the hall, connected to the server, creates several problems. For instance, when it takes extra time to retrieve the printed copy there is a greater probability that mistakes will not be corrected—especially when facing a deadline. In addition, to ensure confidentiality, people run down the hall trailing the document across the LAN, or have someone ready and waiting at the printer.

The second alternative is to attach a printer directly to a PC. This distributes printers to where people use them, saving them the many trips down the hall to retrieve their work. But, this carries significant disadvantages. First, the PC *must* be left running. The printer can be connected to a dedicated print server or to someone's workstation.



The Intel NetPort provides a simple, easy to install LAN printing solution.

The first option, a print server, requires an additional investment in computers to distribute printers throughout the office. The other choice, connecting the printer to a workstation, diminishes the performance of the computer when it is also printing and thus decreases the user's productivity.

NEW OPTIONS

Because of the disadvantages associated with these options, many LAN users have been looking for alternatives. One company, 21st

By 1992 more than 65% of business PCs will be connected to a LAN, compared to 32% in 1988; and by 1993, the number of printers on networks will grow to 7.4 million.

Century Innovations, has turned to Intel's Personal Computer Enhancement Operation (PCEO) NetPort as a solution for its network printing.

When the printers were configured to the server, according to Stephen E. Graves, president of 21st Century Innovations, "I could not get the server printers not to do a forms feed at the end of printing. I couldn't get it to just print and stop, it would always do this no matter what I looked at."

A software development company in Aliso Viejo, near Torrance, CA, 21st Century Innovations publishes Easimap and Cablemap I and II—AutoCAD add-on applications. Its LAN consists of a server with nine PCs, running under Novell NetWare 2.2. The network printers—two 24-pin Epson dot matrix printers—are used primarily for the shared sales tracking system. After a sale is made, a record of the customer is sent to one printer and an accompanying label is sent to the other.

When Graves first heard about NetPort he thought, "I'll try this thing, and see if I can print the way I want to." It worked. He no longer worries about how to configure the NetWare operating system to fill his needs, nor to add a PC as a dedicated print server.

WHAT IS A NETPORT?

NetPort is a small, compact, self-contained print server. It has all the hardware and software needed to plug a printer or plotter anywhere on the network. This 4" x 7" box includes both a parallel port and a serial port. It plugs into any existing T connector location, requiring neither third-party utility software nor client PC software, and eliminates the need for PC or file server memory to support a printer.

"A key benefit of the NetPort print server," said Mark Christensen, "is the plug-and-play installation—a fast, simple procedure that uses standard Novell NetWare commands and menus. The NetPort also provides its own print server software, which resides inside the unit and does not require a NetWare VAP (Value Added Process) or NLM (Network Loadable Module) to execute. Because no VAP is required, the network does not have to be shut down to complete installation." (If someone is already using the NetWare Print Server VAP or NLM, NetPort can link in directly as a remote print server.)

Central to NetPort is Intel's Flash Eprom technology, which allows software upgrades to be downloaded over the network into the NetPort flash memory, where it permanently stores the new information. In addition, NetPort includes a set of command-line utilities that allow the administrator to send and receive status and control information to each NetPort without leaving their office.

As people seek to enhance the capabilities of their computers at work through the installation of LANs, network printers are an important part of this process. NetPort offers an easy-to-install and use method for printing on a network. It works completely transparent and requires no memory on the user's workstation or in the file server. ■

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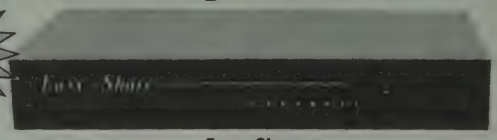

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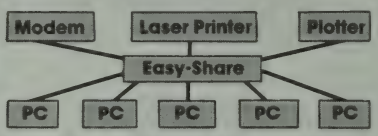

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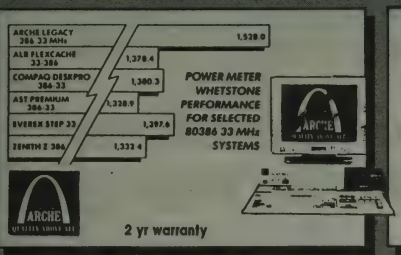

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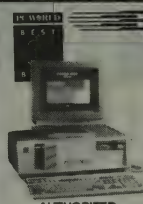

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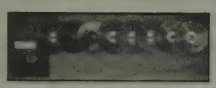

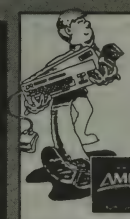

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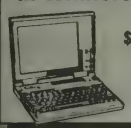

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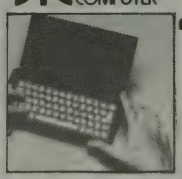

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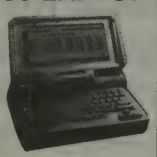

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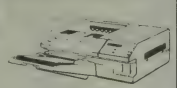

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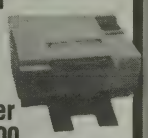

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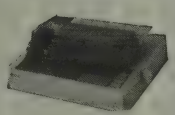

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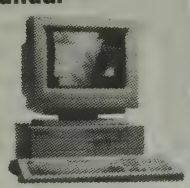

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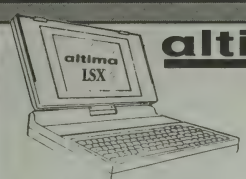

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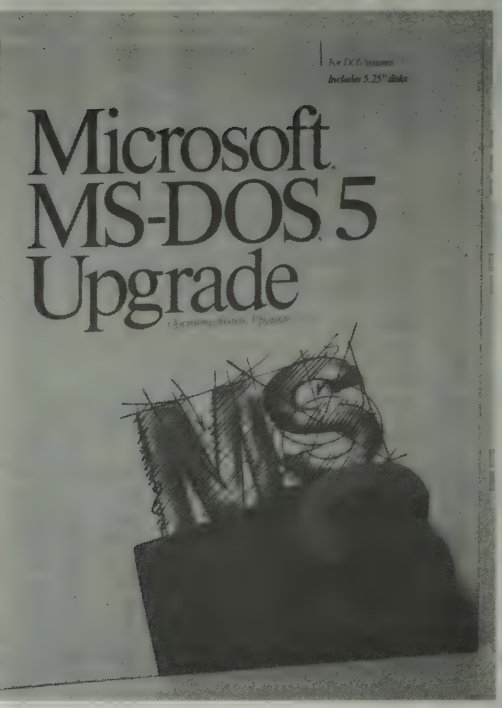
A New DOS For Portables

MS-DOS 5.0 Offers New Features That Are Especially Helpful For Users Of Portable Computers

BY ED KAHN

When Microsoft released DOS 4.0 a couple of years ago it was so buggy that they had to follow follow up with v4.01. This fixed many of the problems, but because of its size and the bad press following the initial release it never attracted much interest. It did, however, have one feature that many users wanted: it could accommodate a hard disk partition larger than 32MB. Users of the earlier versions of DOS were limited to the 32MB for partitions. This meant that even if you had a 40MB hard disk it had to be configured as drives C and D. At best, this was clumsy. Despite this improvement, most users stayed with the older version of the operating system.

Microsoft was determined that the next release of DOS would not only be improved, but also bug-free. They have delivered on this promise with the most highly tested piece of software in the history of computing. The upgrade process began with asking large numbers of users just what they would like to have included in a new version of the operating system. Before its release this past June, Microsoft tested their new creation with about seven thousand users. DOS 5.0 is sold as an upgrade, enabling anyone with an earlier version of MS-DOS to switch to the new version.



In addition to being able to keep your large hard disk as a single partition, there are goodies tucked throughout DOS 5.0. Over the years, a number of products have been introduced to enhance the operation of DOS. Microsoft has incorporated many of these enhancement features. Help, once available only in books and a few standalone programs, is now built into the operating system. Just type "help" plus the appropriate DOS command and a screen will appear telling you about the command and displaying the syntax so you can properly enter the command. If you are not sure which DOS command you need, simply type "help" and an alphabetical list of all the commands will appear with a short description. You can then ask for help with specific commands.

Another feature that has been added is "doskey." This new program remembers the commands you typed in at the DOS prompt and allows you to recall and use them by pressing the up and down arrow keys.

One particularly useful new command is "edit." This simple ASCII editor is ideally suited to modifying config.sys and autoexec.bat files. It certainly is a pleasure after the old "edlin" program, which few mastered and nobody loved.

Installation is also simple. In fact, it's almost amazing. You place the diskette for the upgrade in the A drive and run a setup program. It first reads your system to see how it is configured and the kind of hardware you are using. It then copies all of the new files into the DOS subdirectory and saves the old version in a separate subdirectory. DOS 5.0 also walks you through the creation of an uninstall disk to allow you to move back to your old operating system if you do not like the newer version. Finally, it modifies your config.sys and autoexec.bat files in miraculous ways. When you have completed the installation process, all of your old files are still intact, but you will have considerably more RAM than before; the new version loads most of DOS into high memory.

Continued on page 71

While the DOS shell that comes with v5.0 doesn't compare with the power of DESQview or Windows, it will let you open multiple applications simultaneously and permit you to move swiftly between several open applications. Unlike the more powerful programs, it requires a relatively reasonable amount of RAM. If you have a basic portable computer, you can now run multiple applications at the same time.

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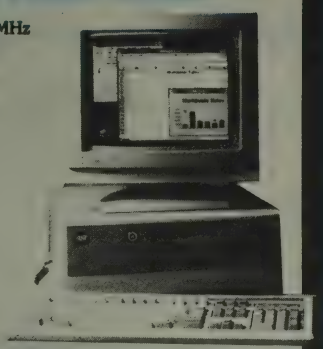

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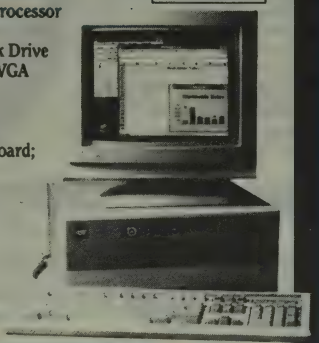

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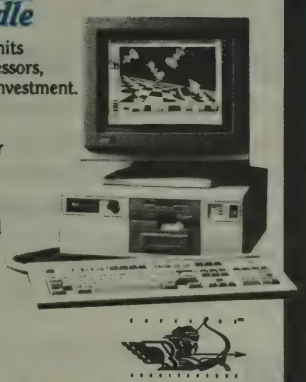

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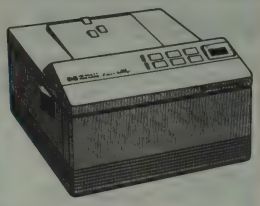

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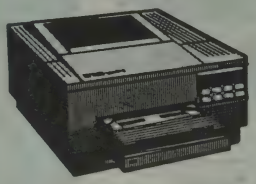

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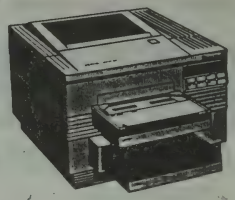

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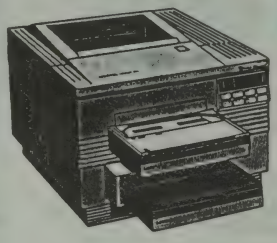

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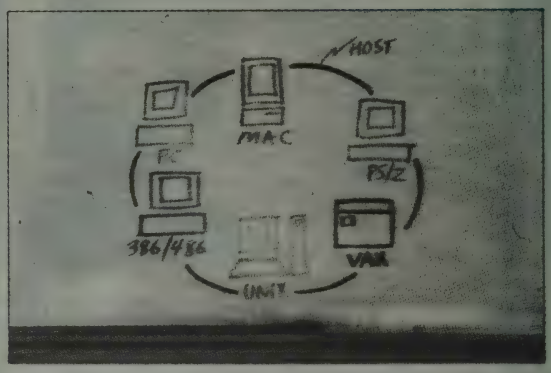

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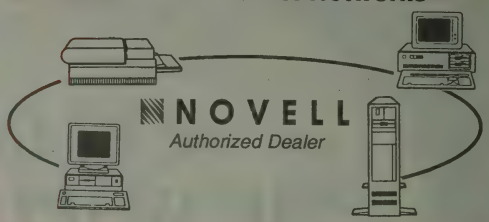

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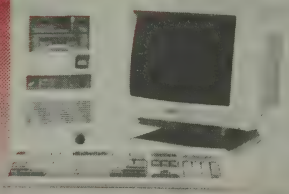

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High-Speed Modem Technology

Understanding How Modems Communicate And How This Is Changing

BY PETER JOHN HARRISON

I remember my first modem. It was an acoustic modem, which meant I had to manually dial the phone, then carefully nest the handset into two rubber cups to establish communications with another modem. A technological classic, it's top speed was 300 bits per second (bps), about 30 bytes a second. I was so proud of it.

Times have changed. Modems have gotten smaller, easier to use, and faster. Modems selling in the $500 price range can move data at speeds up to 38,000bps, 120 times faster than my old acoustic modem, and modems conforming to the new V.32bis standard can transfer data at speeds of up to 57,000bps. That's the equivalent of two pages of single-spaced, typewritten text a second!

Needless to say, my old acoustic modem has been retired.

MODEM TECHNOLOGY AND STANDARDS

High-speed modems are a boon to anyone who moves large volumes of data between computers—but figuring out which two modems will work best for you may bust some brain cells. With the new high-speed technology has come a new high-tech terminology that can be confusing, even for many communications specialists.

To understand this new terminology it is helpful to understand what modems do and how they've changed over the years. My old acoustic modem is a good place to start.

Acoustic modems, like today's high-tech models, convert binary signals from a computer into a series of audible tones to send over a phone line to another, similar modem that translates it back into the original series of binary signals. The two rubber cups on an acoustic modem contain a speaker and microphone for sending and receiving these tones through a telephone handset.

My old acoustic modem, like all other 300bps modems, used a technique called Frequency Shift Keying (FSK) to encode each bit into a high or low tone (frequency). Each frequency "cycle" sent one bit to the receiving modem.

Modern modems and Fax machines do the same thing, but instead of using two frequencies to transmit one bit at a time, modern modems divide each frequency cycle into four parts. Each part of the cycle is manipulated using a technique called Quadratic Amplitude Modulation (QAM) to send a separate bit to the receiving modem, which reassembles the bits into the correct bit pattern.

Modems running at 2400, 4800, and 9600bps all support QAM, but at higher speeds this technique requires a good phone connection with a minimum of static and background noise to work well. At 9600bps, almost any line noise will confuse at least one of the four bits being sent during the frequency cycle. To help tame noisy phone lines, an even more sophisticated transmission technique, called Trellis Coded Modulation (TCM or simply "Trellis"), sends a pattern of frequency shifts in each part of the cycle to create a signature the receiving modem can identify. With TCM, even if part of the signature is lost due to a burst of static, the receiving modem can usually identify each bit's signature correctly.

Slower modems, like the 2400bps modems that have been the mainstay of microcomputer communications, use QAM to send their data because at this speed it is easier to sort out the static from the actual sounds sent by the transmitting modem. Fax machines running at 9600bps can also get away with using QAM, because if one bit here or there is wrong, it doesn't make the Fax received at the other end much harder to read. Modems sending data files, however, need to be accurate all the time, so most high-speed modems support QAM for speeds up to 9600bps,

High-speed modems are a boon to anyone who moves large volumes of data between computers—but figuring out which two modems will work best for you may bust some brain cells. With the new high-speed technology has come a new high-tech terminology that can be confusing.

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and TCM or a similar technique to maintain integrity at speeds of 9600bps and up.

Of course, modems cannot communicate unless they are using the same frequencies and modulation techniques. To help establish how each kind of modem will communicate, organizations, like American Telephone and Telegraph (AT&T) and the Geneva-based Comité Consultatif Internationale de Télégraphie et Télephonie (CCITT), have set standards that define how modems conforming to their standards are to work.

Times have changed. Modems have gotten smaller, easier to use, and faster. Modems conforming to the new V.32bis standard can transfer data at speeds of up to 57,000bps. That's the equivalent of two pages of single-spaced, typewritten text a second!

Not all modems conform to the standards set by these organizations. U.S. Robotics, CompuCom, and Telebit all offer modems that use proprietary modulation techniques that allow them to communicate at 9600, even 14,400bps, but only if both modems are the same brand and model. If one of the modems doesn't support the other's high-speed format, both modems must "fall back" to a slower modulation technique that they both recognize.

Most 1200bps modems, for example, tend to follow the "Bell 212A" standard, and 2400bps modems conform to CCITT's "V.22bis" standard for data transmission. Over the last few years, though, one high-speed standard has won wide support from both microcomputer and mainframe computer users. CCITT's V.32 allows two modems to communicate with each other at 9600bps, or about 960 characters a second. V.32 also supports a fall back speed of 4800bps, used when the phone line has too much noise or static to work well at the higher speed. Most V.32s will also recognize and communicate with the slower 1200 and 2400bps "Hayes Compatible" modems used with many microcomputers, though this is not actually part of the V.32 specification.

A newer CCITT standard, V.32bis, was approved last May. V.32bis expands the V.32 standard by extending the top transmission speed to 14,400bps, and establishing 12,000 and 7200bps as fall back speeds for noisy lines. Since V.32bis is an extension of the older specification it maintains full compatibility with 4800 and 9600bps V.32 modems. V.32bis also defines how to recognize and connect to slower 2400bps V.22 and V.22bis modems, something modem manufacturers have been doing, but for which no CCITT standard had existed. Modems supporting this newer standard should start appearing this summer.

ERROR CORRECTION

As modem transmission speeds have gone up, problems with line noise and data integrity have increased. To guarantee accuracy, most high-speed modems employ a technique called error correction, which catches errors and corrects them before they are passed on to the receiving computer.

MNP-4 and V.42 modems assemble outbound data into groups of bytes, called data frames, and apply a mathematical equation to calculate a unique value called a checksum for each group. Data frames are transmitted with their checksums, and the receiving modem reexamines each data frame once it is received to work out a new checksum. If the checksum calculated by the receiving modem matches that received with the data frame, the data was received without error, and the receiving modem passes it on to the computer and requests the next data frame from the sending modem. When the checksums don't match, the data is discarded and the sending modem is asked to resend the data frame.

Older error correction techniques, like MNP-2, add the checksum value to the end of the string of bytes in the data frame, which slows the rate of data transfer down. Newer techniques, like MNP-4 and V.42, actually speed up the rate of data transfer. When the sending computer assembles the data to be transmitted to the remote computer, it adds extra bits, a "start" and "stop" bit, to each byte. By stripping off these leading and trailing bits, MNP-4 and V.42 reduce the total number of "data" bits sent, and create additional space for transmission of the checksum and data frame acknowledgments.

Error free protocols guarantee the integrity of transmitted data, but will only work if both sending and receiving modems support the same error correction features. Since we can't always dictate what kind of modem we'll be calling, modems with error correction send a stream of data identifying the type(s) of error correction they support just after the connection is established. If one modem or the other fails to respond correctly, the error correction features are turned off, and the modems communicate normally, and send information one byte at a time, instead of in data frames.

DATA COMPRESSION

Another common feature supported by most high-speed modems is data compression. Data compression techniques like MNP-5 and V.42bis examine the data being sent and compress it into a more concise form, reducing the number of bits required to send the data, and increasing the rate of data "throughput." Of these two commonly available data compression techniques, MNP-5 is the easiest to understand.

MNP-5 analyzes the information being sent to figure out which 8-bit byte patterns are sent most and least often. After building a dictionary of character frequencies, it assigns a short, 2-bit sequence to the most frequently used byte, a 3-bit code to the second most common byte, and 4-bit codes to the next three bytes. If you were sending a text file, for example, the letter "e" and certain other letters would occur much more often than other characters. MNP-5 would identify these frequently used byte codes and transmit them in less than half the time it would take to send their usual 8-bit code with start and stop bits. Less used byte codes, such as the letter "z", would be coded in longer bit sequences, using up to 11 bits to transmit a single character; but since they are sent much less often than those characters assigned shorter codes, MNP-5 can frequently double the rate at which data is transferred between the two modems.

V.42bis also translates frequently sent sequences of bits into shorter sequences. Instead of building a dictionary of character frequencies, V.42bis translates groups of characters that are sent frequently into shorter codes. Strings like "the" or the suffix "tion" are sent using a fraction of the bits they would ordinarily require. V.42bis substantially increases the rate of data transfer, and can cut by 75% the amount of time required to send a spreadsheet or text file.

Error correction techniques and compression algorithms do not work equally well on all kinds of data, and it is sometimes best to transmit data without these features turned on. Information compressed into "*.ARC" or "*.ZIP" files, for example, has already been compressed using techniques very similar to MNP-5 and V.42bis, and don't have fre-

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quently recurring byte codes or strings; trying to compress them a second time actually tends to increase the number of bits sent and slow the rate of data transfer down.

Error correction and compression techniques can also be a problem if you're signed on to a bulletin board service and are typing and receiving short strings of data. Because error correction and compression techniques send data frames, not individual bytes, information gets sent and received in chunks, so the information sent to and received back from the BBS jerks across the screen instead of arriving in a smooth stream of characters.

HARDWARE AND SOFTWARE TO SUPPORT THE MODEM

Computer hardware and software also affects high-speed modem performance. Older communications circuits use the "8250" UART chips with a 1-byte buffer. When modems topped out at 1200 or 2400bps, a 1-byte buffer was large enough to hold the information received by the modem until the system was ready to read it in; but at 9600bps, 1byte of data is transferred through the computer's serial I/O card or communications circuitry each millisecond. If the computer is busy storing a block of information received during a file transfer for more than a millisecond, that data is lost. Newer "16550" UART chips have a 16-byte buffer that prevents data from being lost when the computer isn't available to read received data from the UART. People with older computer systems may want to consider buying a new serial card with one of these newer UART chips to help keep their data intact.

Quality communications software can also help preserve data integrity. Better communications packages use "flow control" commands to tell the sending or receiving modem to delay the data transfer process while the computer is busy. If your communications software is an older package, chances are it doesn't support flow control, and you should consider buying or upgrading to a newer package. Some modems are sold with communications software that supports flow control.

AN ENDURING STANDARD

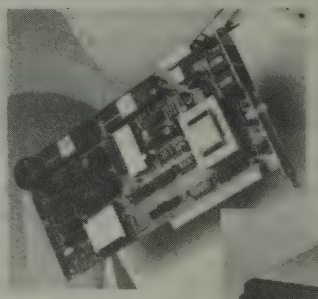
Modem technology is speeding up and changing all the time, but only a few technologies catch on and define the "standard" used by the majority of microcomputer users. More and more communications services, like MCI and CompuServe, are offering V.32 lines to their customers, and individual computer users are buying high-speed modems to take advantage of the faster rates of data transfer and faster response times. It has become clear that V.32 technology has caught on and will be an enduring standard we can all use and depend on. ■

High-Speed Modem Review

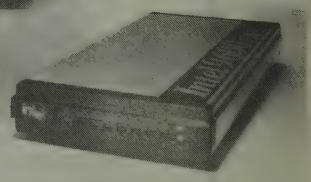
Five Modems That Can Move Your Data At 38,000 Bits Per Second!

Two years ago, 9600bps modems cost $1500 and up, well beyond the reach of the average microcomputer user. These days, though, V.32 modems with 9600bps transmission rates are available starting around $500; and those willing to forgo V.32 compatibility can find modems for less than $150.

The four V.32 modems I looked at all have similar features. All offer V.32 transmission at 4800 and 9600bps, and work with the more familiar 300, 1200, and 2400bps modems that have dominated the microcomputer market until now. All four modems support error correction and data compression features (V.42/V.42bis and MNP levels 1–5) to boost their maximum throughput rates up to as much as 38,400bps. The fifth modem I tested offers an alternative to people controlling the type of modem at both ends of the communication.



CompuCom Speedmodem Champ



Intel 9600EX

THERE'S MODEMS AND THEN THERE'S MODEMS

Intel's 9600EX, Computer Peripheral's Viva 9642e, E-Tech's Bullet 9696M, and Practical Peripheral's 9600SA all worked well in their V.32 mode at 9600bps. All four modems were able to send and receive my 127K test file in about 138 seconds (with error correction and data compression turned off), very close to the absolute best possible speed available for a V.32 modem. All of them were able to establish error free connections using MNP-4 or V.42 protocols, and provide data compression using either MNP-5 or V.42bis. Any of these modems would be a good choice for their ability to move data reliably at high speeds.

However, modems aren't identical. The E-Tech modem, like the other three modems, works fine on a dial-up phone line, but also offers the option of using 4-wire "leased" lines, a capability needed for some data processing applications. E-Tech's documentation, however, fell short: the manual has no index, and documentation on the modem's V.42 and V.42bis features came in a separate 3-page addendum. One very big point in the Bullet 9696M's favor, though, is that it

RESOURCES

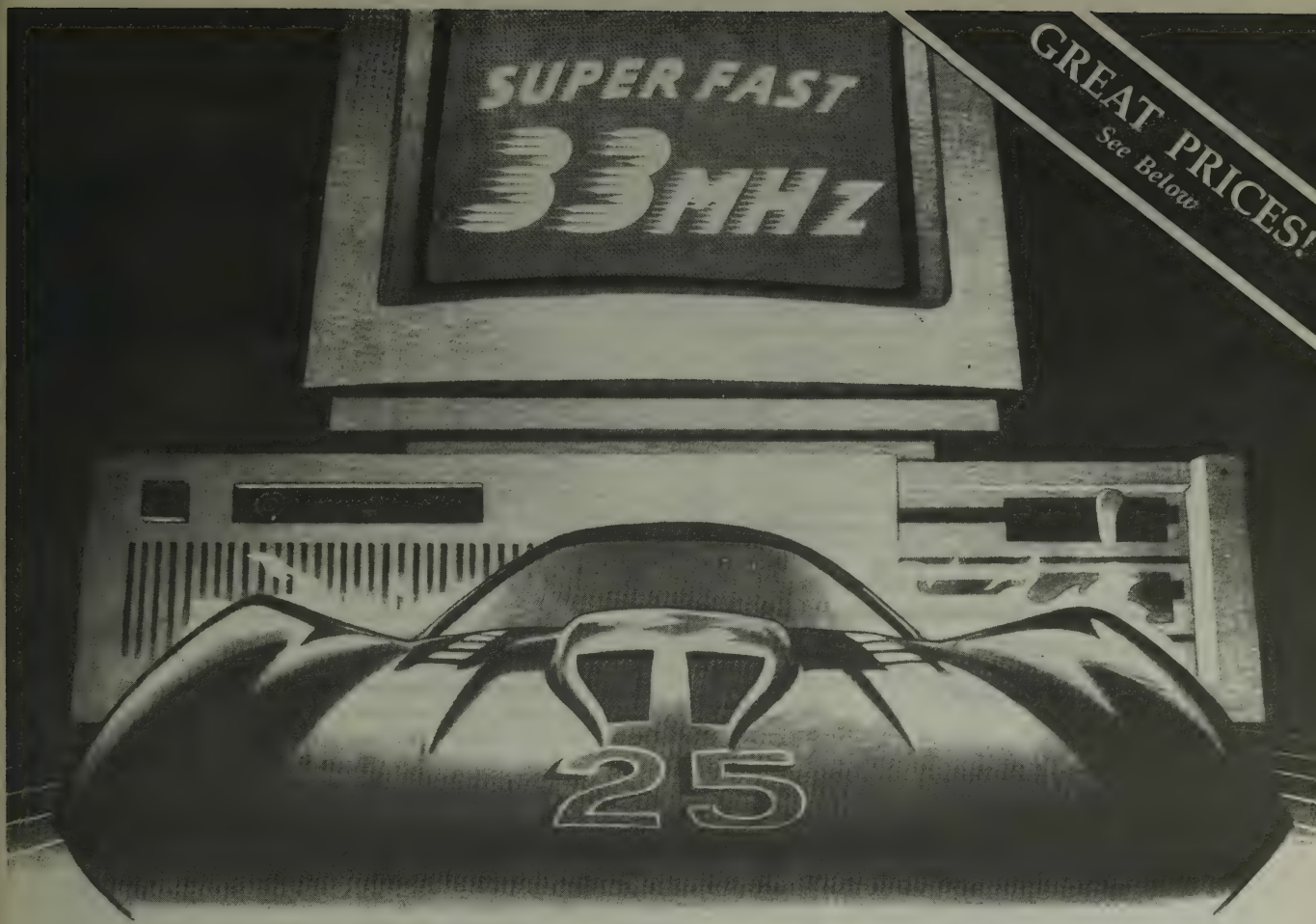
Bullet 9696M ($795)
E-Technology, Inc.
3525 Ryder St.
Santa Clara, CA 95051
(408)730-1388

9600SA ($699)
Practical Peripherals
31245 La Baya Dr.
Westlake Village, CA
91362
1-800-442-4774

Viva 9642e ($649)
Computer Peripherals
667 Rancho Conejo
Blvd.
Newbury Park, CA
91320
(805)499-5751

9600EX ($799)
Intel Corp.
5200 N.E. Elam Young
Pkwy.
Hillsboro, OR 91724
1-800-538-3373

Speedmodem Champ ($149)
CompuCom Corp.
1180-J Miraloma Way
Sunnyvale, CA 94086
(408)732-4500



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- SH VGA SYSTEM: **$2095**

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- 125MB fast hard drive 18(ms)
- Serial/Parallel port
- Enhanced keyboard
- 486-33MHz option

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WEEKLY SPECIALS

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B. Micro Cache 386SX-20MHz
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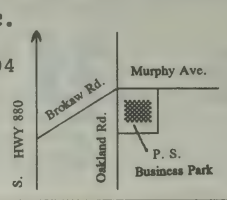

is the only V.32 modem I tested that was available as either a standalone external modem or as an internal (PC-compatible) card.

While the Practical Peripherals 9600SA performed well, I had problems following the documentation. In particular, I found it frustrating that there was no appendix or section summarizing each of the modem's "AT" commands. The 9600SA was also the only modem tested that did not support synchronous communications or 2-wire leased lines, though most microcomputer users will never need or miss these features. One point in the 9600SA's favor is the thoughtful positioning of the power on/off and answer mode feature selection buttons, which are right on the front of the modem where you can reach them.

Computer Peripheral's Viva 9642e came with a single, well-organized manual that I found easy to use and follow. I didn't like the status lights, though, which have little pictures that depict the light's meaning, instead of a standard 2- or 3-letter abbreviation. The 9642e is the smallest of the four V.32 modems I looked at, measuring just 2" x 5.4" x 5.7", and it's rounded edges and separate stand make it the most visually attractive of any modem I've ever used. The Viva 9642e also comes with communications software, so pretty much everything you're likely to need except the modem cable comes with the modem.

Intel's 9600EX also comes with communications software and excellent documentation. The 9600EX was the only modem that came with a command reference card and separate Installation Guide. Another nifty feature of the 9600EX is the TESTCOM diagnostics program that comes with the modem. TESTCOM can help you identify and fix problems with the modem, phone line, and serial port.

AN ALTERNATIVE MODEM

For those of us who need to adhere to internationally accepted V.32 standards, any of these four modems is an excellent choice. If, however, you are able to dictate what kind of modem will be at each end of the connection, there are alternatives to spending $500 for a V.32 modem.

CompuCom's Speedmodem Champ is a 9600bps PC-compatible internal modem with a list price of $149—a fraction of the cost of a V.32 modem. Like the modems I have already mentioned, the Speedmodem Champ can connect with modems using familiar 300, 1200, and 2400bps standards, has a 9600bps transmission speed, and offers error correction and compression features that can quadruple the actual rate of data transfer. Unlike the other modems mentioned here, Speedmodem Champ uses it's own 9600bps transmission, error correction, and data compression techniques when running at 9600bps (MNP levels 1–5 are available at other speeds).

I had no problems getting the Speedmodem Champ to connect with standard 1200 and 2400bps modems, or with other Speedmodem Champs at 9600bps. The Champ seems to be a pretty good modem for uses that don't require sticking to the accepted 9600bps standard. Unfortunately, the Speedmodem Champ comes only as a PC-compatible internal card, so Mac and laptop users are out of luck when it comes to buying this cheap, high-speed modem. I also would have preferred better documentation—most of the Speedmodem Champ's documentation comes on disk, the only printed documentation is in the 24-page Users Manual, which covers the basics of how to install and use the modem.

For people who use programs to access or send data from remote locations, high-speed modems offer a way to cut phone costs and insure the accuracy of the data being sent. Whether you select a V.32 compatible modem, or buy a less expensive non-V.32 modem is up to you.

—Peter John Harrison

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SMC PC500 16-BIT COAX....170
Thomas Conrad 8-BIT COAX STAR/BUS....92/106
Thomas Conrad 8-BIT TWISTED PAIR....106
Thomas Conrad 16-BIT COAX STAR/BUS...240/270
Thomas Conrad 16-BIT TWISTED PAIR....240
Thomas Conrad MC COAX STAR....258
Thomas Conrad MC TWISTED PAIR....258
Thomas Conrad MC COAX BUS....280
Tiara Lancard/A PC Twisted Pair....139
Tiara Lancard/A PC 8-BIT COAX....99
Tiara Lancard/A PC Hiz BUS....146
Tiara Lancard/A AT Twisted Pair....195
Tiara Lancard/A AT 16-BIT COAX....190
Tiara Lancard/A AT Hiz BUS....206

Ethernet

3COM 3C503 5 Pak, No Doc or Driver....804
3COM 3C503 ETHERLINK II....198
3COM 3C505 ETHERLINK PLUS....593
3COM 3C523B ETHERLINK/MC....276
3COM 3C507 5PK, No Doc or Drivers....1,345
3COM 3C507 16-BIT ETHERLINK....289
3COM 3C523B 5PK Micro Channel....1,218
3COM 3C543 ETHERLINK/NB (MAC)....386
3COM 3C505 ETHERLINK PLUS 5 Pak....2,746
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Hayes ETHERMATE 8-BIT COAX....129
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Novell NE1000 8-BIT/NE2000 16-BIT....172/202
Novell NE2/2A Micro Channel....271
Novell NE3200 32-BIT EISA (*In Stock*)....820
Racal ES3210 32-BIT EISA....708
SMC 16-BIT COAX MC....219
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Thomas Conrad 16-BIT COAX....279
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Aquila 10BASE-T MC....150
Racal ES3210/10T 32-BIT EISA....708
SMC 3008TP 8-BIT Twisted Pair....188
SMC 16-BIT Twisted Pair MC....231
Tiara 10 BASE-T 8-BIT/16-BIT....193/210
Thomas Conrad 16-BIT w/ RJ45....279
WD Ethercard PLUS 10T 10BASE-T....202
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Xircom Ethernet ADPTR EX TRCVR....372
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Fresh Tech. Map Assist v2.0....226
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Building Your Own Server, Pt. 2

Video And Mass Storage

BY WAYNE A. YACCO

Last month this column covered the motherboard, case, and memory components of the build-it-yourself network server. This month it continues with video and mass storage.

SERVER VIDEO

This particular server I discussed last month is based on a Micronics '486 EISA motherboard. I really like the motherboards from Orchid also, but they aren't shipping an 80486 yet. They also make—and are currently shipping—some great video controllers based on the Tseng 4000 chip set.

You don't need fancy video for a Novell file server, because it's dedicated to serving the network and doesn't run any applications that would benefit from it. However, Orchid's controllers are also very reliable and less expensive than some boards that offer less. You could justify them on that basis alone.

LOCAL AREA NETWORKS

The truth is though, that I usually use just one of my potential servers as a server at a time. The rest are used as workstations, either standalone or connected to other servers. One server is reserved for DOS-based peer-to-peer nets; that one can be used as a workstation all the time. If you use your server as a workstation, Orchid's ProDesigner IIs will give you up to 32,768 colors at 640 x 480 resolution (1MB version). It supports other resolutions up to 1024 x 768.

FLOPPIES

With IBM's recent introduction of the 4MB floppy in its high-end PS/2 systems, it's a likely bet that we're on our way to a new standard. Since you would hope to get several years of use from your server, that makes a 4MB drive the floppy of choice. It's true that you may not feel like buying many ED disks until prices fall, but these drives also support both the 720KB and HD disks. Going with the 4MB drives now will give you the ability to handle any medium that's thrown at you, and will probably save you an upgrade later.

There is one glitch with these drives. Standard controllers don't handle them. You need to get a recent upgrade, or a separate floppy controller designed specifically for them. Longshine makes one of the first floppy controllers for the 4MB format. It is well made, properly documented, and supports as many as four drives. There's one limitation: the DOS format command won't work properly. There just isn't any provision for these drives in versions of DOS before 5.0. Longshine includes its own format routine built into the controller, but you need DEBUG to use it. So, it's not convenient. Fortunately, other DOS commands such as DISKCOPY work normally. If you are using DOS 5.0, of course, this is not an issue. DOS 5.0 fully supports 4MB floppies with this controller—including the DOS FORMAT command.

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FIXED DISKS

A server's primary function is to provide shared access to common files, so mass storage is critical. It must be reliable, and it must be fast. Speed is very important because the drive's access time, not the CPU's processing speed, will be the limiting factor for most servers.

One way of getting fast access to your hard disk is to buy a drive with a low average seek time. This is easy. Hard disks large enough to serve many users typically have acceptably fast seek times. As fast as they might be, though, they're strictly from Pasadena in comparison to memory speeds. If you want a very responsive server, the only way to go is with a caching controller. Caching controllers include their own memory for temporarily storing files. Whenever possible, they use the files in memory rather than going to the much slower hard disk. The more memory, the more files can be stored off the drive, and the more often your transactions will be done in the memory cache.

With an EISA server, you can further increase caching efficiency by using a bus master. If a controller is also a bus master, it can process in parallel with other processors in the machine, and have independent access to other resources as well. The more extreme variety, the drive array, provides parallel access to multiple gigabytes of superfast online storage.

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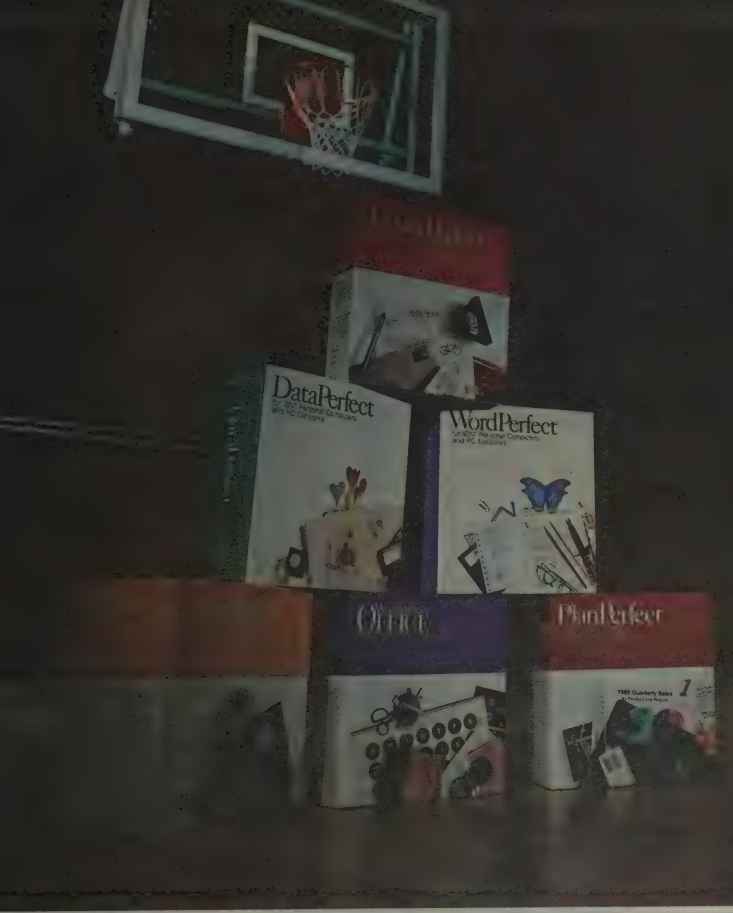

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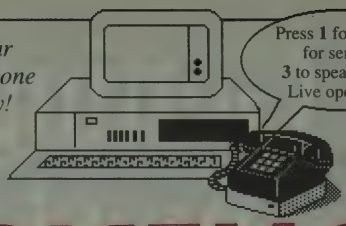

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With IBM's recent introduction of the 4MB floppy in its high-end PS/2 systems, it's a likely bet that we're on our way to a new standard. Since you would hope to get several years of use from your server, that makes a 4MB drive the floppy of choice.

One of the speedier controlers around, though not an EISA bus master, is the FastCache 32 from Corporate System Center. CSC claims Core Test results of 0.1ms access and 2000KB/second transfer. This is a seven-device SCSI controller with support for 32MB of memory, up to four floppies (easily disabled), and disk mirroring. The latter is a feature which writes everything to two drives, eliminating the need to back up to other media. Several exceedingly useful utilities, all cables, 1MB, and a five-year warranty are included in the $395 price.

But CSC doesn't really want to sell you the FastCache for $395. They want you to buy it for $295—with any drive they sell. In the 600MB range that I wanted, that drive was a 16ms Maxtor XT8760S (formatted capacity 664MB). Owner Martin Bodo says this is among the most reliable drives available, and there are several reasons I took him at his word. First, he sells several brands (Seagate, HP, and others). He also publishes a book called the Hard Drive Bible which is full of drive statistics, controller settings, and generally useful hard disk information. Finally, he rebuilds drives in a real clean room, replaces the heads and all media on every drive he fixes, and checks them with an analog tester. He'll even back up his refurbished drives with a five-year warranty (for some extra bucks). Like the cache controller, these drives are shipped with documentation. CSC will even preformat the drive for DOS, Novell, or Apple at no extra charge, if you ask.

I wouldn't recommend the refurbished drives to everyone. You'd only save between two and four hundred dollars on a XT8760S with a year warranty. The factory warranty is five years; if you're only buying a single drive, the difference would be too much of a crapshoot for a couple of hundred dollars on a $1700 drive. However, if you're buying in quantity, say for a drive array or a department, then the risk gets spread. Since CSC also drops the price for volume purchases, it's worth looking into.

I'll try to wrap this installation project up with the next column. ■

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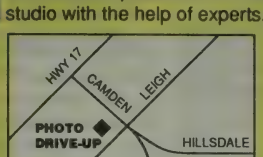

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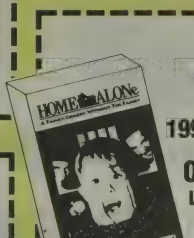

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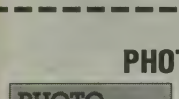

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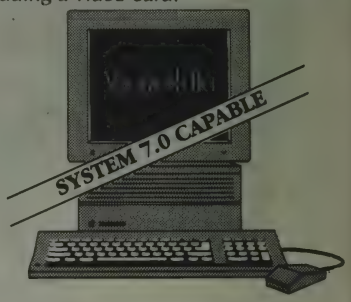

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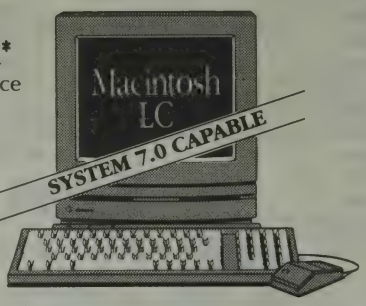

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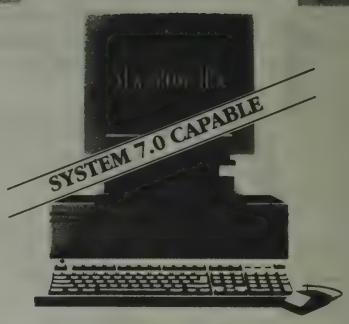

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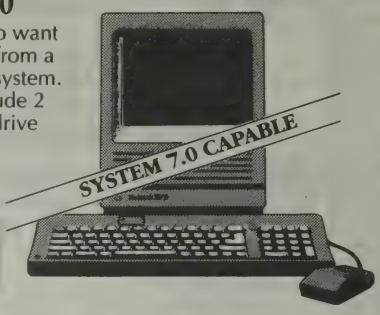

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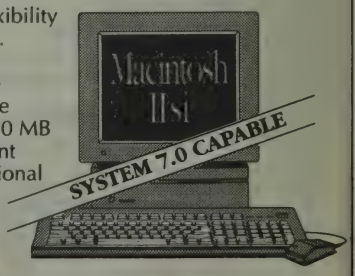

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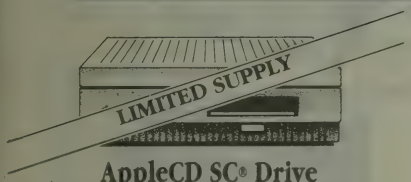

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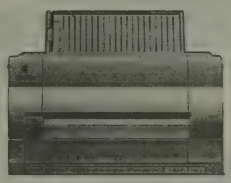

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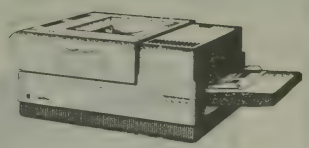

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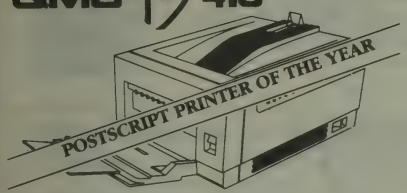

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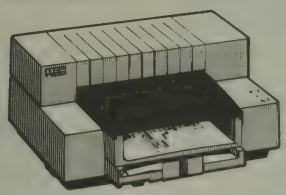

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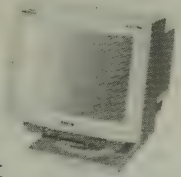

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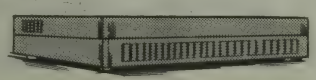

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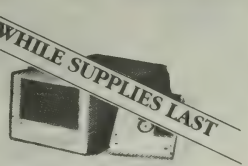

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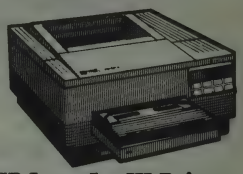

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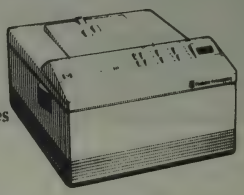

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- Versatile paper handling capabilities
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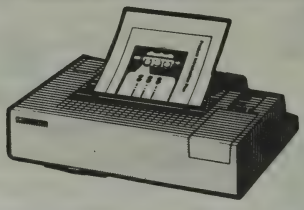
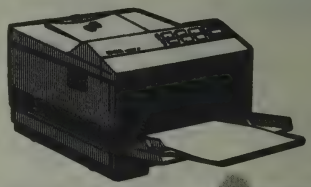




HP PaintJet Color Graphics Printer

- High quality color charts & graphics
- PC or Macintosh® compatible
- Wide range of software support.

995.

HP LaserJet IIP Printer

- Most affordable HP Laserjet printer
- Publication quality output.

829.

HP LaserJet IIP / PostScript Printer

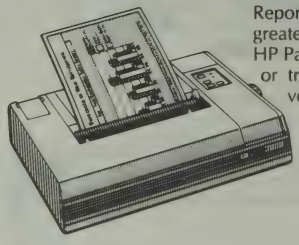
- Fast 4 PPM printing
- 1.5 MB RAM—includes PostScript
- Macintosh® ready/ plug 'n play

#33427A

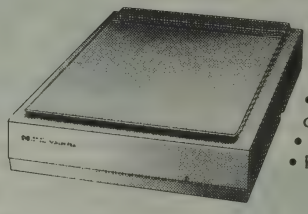
1495.

Color Me Brilliant
HP PaintWriter

Reports and presentations achieve their greatest impact in color produced by the HP PaintWriter printer. Prints on paper or transparency for maximum versatility. Compatible with Macintosh® color computers.



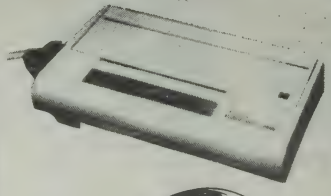
995.



HP ScanJet Plus Scanner

- 256 grey scale levels (8 bit) for high-resolution images
- Wide range of contrast & intensity control
- PC or Macintosh compatible
- Price includes interface.

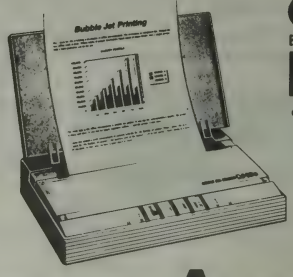
1149.



Kodak Diconix 150 Plus

The laptop companion that prints in draft, NLQ and/or quality mode, designed with portability in mind.

379.



Canon BUBBLE JET PRINTER BJ-10e

- Portable 300 dpi printer
- Optional sheet feed.

349.

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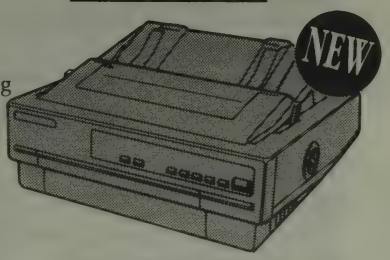
EPSON®

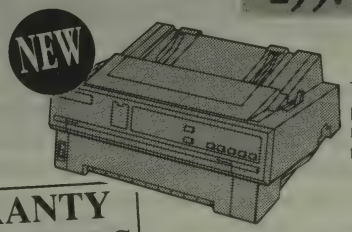
ESC/P2™ EPSON SCALABLE FONTS • ENHANCED GRAPHICS

LQ-570

This new 24 pin printer utilizes scalable fonts, enhanced graphics and advanced paper handling to offer more performance than any printer in its class at an affordable price.

299.





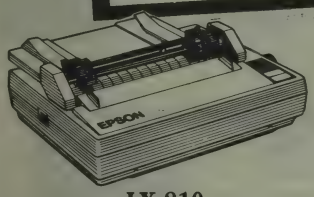
LQ-870

This new 24 pin printer is a major step forward in printer technology with high speed, and high performance that sets a new industry standard for quality with scalable fonts.

489.

LQ-1170 Wide Carriage Model.....699.

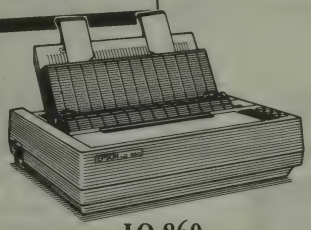
TWO YEAR WARRANTY ON ALL EPSON PRINTERS



LX-810

- 9 pin • SmartPark™ paper handling
- 200 CPS super draft • 30 CPS NLQ
- High resolution graphics.

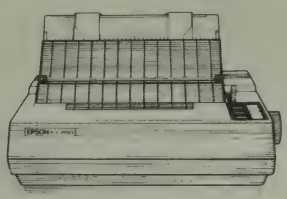
159.



LQ-860

Epson's newest letter quality color printer
- 300 CPS draft
- 98 CPS NLQ

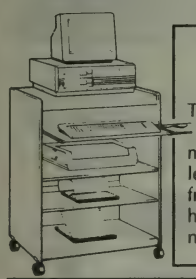
569.



FX-850

- 9 pin dot matrix • 264 draft 54 NLQ
- Push tractor paper park for single sheet feed.

295.



All-In-One Mobile Microcomputer Center

The answer to your storage problem. This space saver is designed to organize your entire microcomputer system- including your printer- in less than three square feet of floor space. Crafted from wood solids and matching veneers, this is a high quality solution for your computer furniture needs.

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We now carry a full selection of Maxell brand printer ribbons. Long lasting and reasonably priced, Maxell ribbons are designed to fit the most popular printers available today. **Come in and check it out!**

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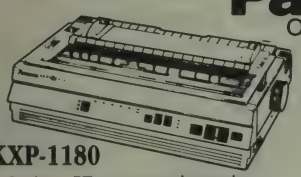
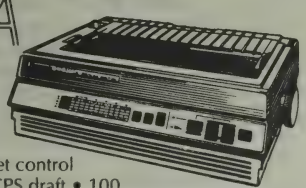


KXP-1180

- 9 pin • EZ set control panel
- 192 CPS draft
- 38 NLQ • 6 resident fonts
- Push/pull tractor
- 11.7" carriage.

149.



KX-P1124i

- 24 pin • EZ set control panel • 300 CPS draft • 100 CPS NLQ • 36 CPS SLQ • 8 resident fonts
- Push/pull tractor • 360 x 360 dpi graphics
- 2 year manufacturer's warranty

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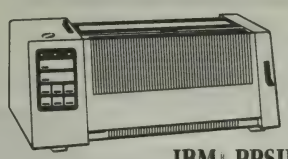
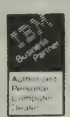
Connecting Point





IBM® PPSII

IBM introduces 2 new 9 pin printers that can print crisp, six -part forms and thick paper stock with no problem using straight paper path technology. Solid and reliable, these printers perform flawlessly. 2380 Narrow Carriage .....349.

2381Wide Carriage.....499.

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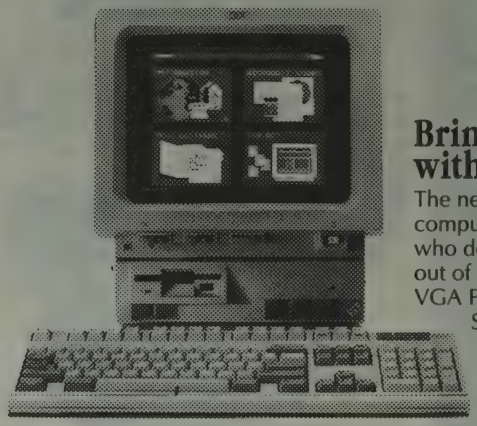

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The new IBM PS/1 is the ultimate home computer brought to you by the people who defined personal computing. Right out of the box you get a high resolution VGA Photo Graphic™ display, an IBM Selectric Touch™ keyboard, a mouse and a built-in modem. Plus you get IBM DOS and Microsoft Works®, the best selling integrated software package with word processing, spreadsheet, communications, and database programs. You also get, at no extra charge, 3 months free of the Prodigy® service for home shopping, banking, travel arrangements and more. This is an easy to use computer at an affordable price. Come see it in action today at Whole Earth Access.

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NEW FROM IBM

IBM® PS/2® 35sx

Based on an 80386sx processor operating at 20 Mhz, this latest model IBM PC offers the classic ISA buss allowing easy upgrades at reasonable cost. 2 MB of RAM and a fast 17 MS 40 MB hard drive insure top performance. VGA on board.
Monitor extra.

1795.

IBM® PS/2® 40sx

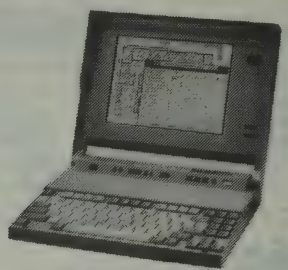
For more expansion capabilities step up to the PS/2 40sx with 5 slots open. VGA hard drive controller and I/O are all on the motherboard. 2 MB's of RAM come standard with up to 16 MB maximum on the system board. An 80386sx operating at 20 Mhz speeds every operation along.
Monitor extra.

2095.

IBM® PS/2® 55sx

IBM's best selling PC is now available at a very special price. 2 MB's of RAM, VGA on board and a 30 or 60 MB hard drive make this system a hot home or home office unit.
Monitor extra.

STARTING AT 1595.



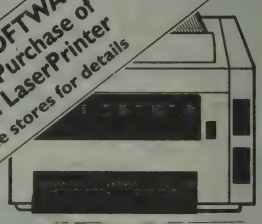
IBM® PS/2® L40sx

Full featured, fast and flexible, the L40sx is IBM's new no compromise notebook PC. 2 MB of RAM expandable to 18 MB , VGA display, 20 Mhz 80386sx processor and 60 MB hard drive make this system an outstanding choice for the business traveler.

3999.

PS/2 Available in Berkeley and San Jose Stores Only

FREE SOFTWARE with Purchase of IBM LaserPrinter See stores for details



IBM® Laser Printer E

At 5 pages per minute this 300 dpi laser will stand tall on your desk, saving valuable space. It has the best paper handling capabilities in the industry.

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4019 IBM All Stores

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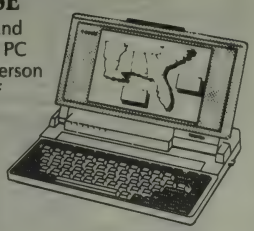
Toshiba T1000 SE

Toshiba's affordable and easy to use Notebook PC for today's business-person on the move.Plenty of comfortable features.



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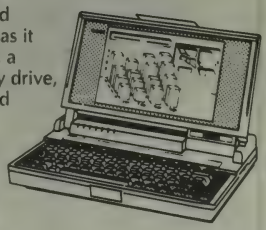
Toshiba 1000LE

Toshiba's 6.5 pound notebook PC that has it all. A 20MB HDD, a 3.5"/1.44MB floppy drive, a terrific display and keyboard.



1399.

Power Packed T1200XE/40

Carry 286 hard disk power in your briefcase.The Toshiba T1200XE features a large, bright display, a comfortable keyboard as well as many other performance features to enhance your productivity.

T1200XE/20 .....1849.

Limited Stock

2099.

Toshiba T2000SX/20

- Toshiba's most powerful notebook computer
- High performance—386SX™ processor
- Super ergonomics—only 6.9 lbs.

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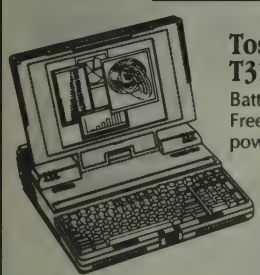
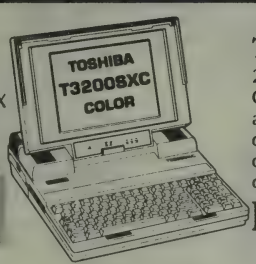
TOSHIBA DESKTOP REPLACEMENTS



Toshiba T3100SX/80

Battery-operated T3100SX Freedom to use 386SX power anywhere.

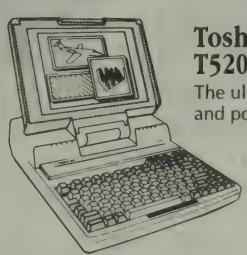
3199.



Toshiba T3200SXC

20 MHz 80386™SX CPU. Color TFT-LCD active matrix VGA display. 120 MB hard disk drive. See one in our Berkeley Store.

LIMITED STOCK

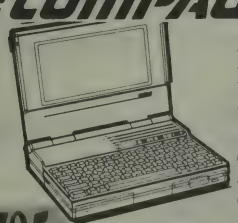


Toshiba T5200/200

The ultimate in power and portability.

4899.

COMPAQ LTE/286 COMPAQ COMPAQ LTE 386s/20



Model 40

- 8.5" x 11" & only 7 lbs.
- 1.44 MB floppy drive
- 40MB hard drive.

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Power without the Pounds

The LTE 386s/20 uses a 20 mhz 386sx processor with cache memory design and a 16 bit graphics controller, the LTE 386s/20 packages this optimal performance in a 8.5 by 11 inch PC weighing 7.5 lbs.

Starting At 3495.

SHARP

Only 4.4 lbs!

- 12 Mhz 80286
- VGA paper-white LCD display
- 20MB hard drive
- 1 MB RAM
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LTE 286/20 **1595.** LTE/20 **1395.**

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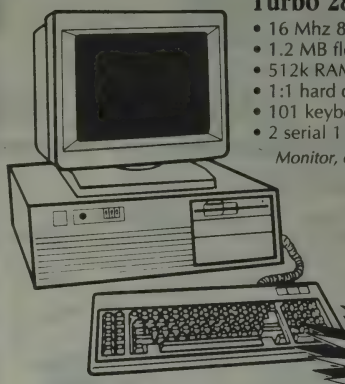

Turbo 286 16

- 16 Mhz 80286
- 1.2 MB floppy
- 512k RAM
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

Monitor, display card extra

499.

386SX

- 16Mhz 386SX
- 1 MB RAM
- 1.2 MB floppy
- 1:1 hard drive controller IDE
- 101 keyboard
- 2 serial 1 parallel port

595.

FREE SOFTWARE "Night Shift" by Lucasfilms™ Games FREE with Purchase of a Complete* VGA ComputerSystem. Offer good while supply lasts. *CPU and Monitor

386/33 Mhz

- 1 MB RAM
- 1.2 MB floppy drive
- 1:1 hard drive controller IDE
- 64k cache
- 101 keyboard

995.

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WEA 486-33 Standard

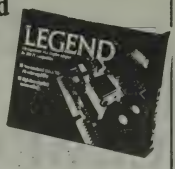
• 4MB RAM upgradable to 8 MB on motherboard; • I/O, 1.2 MB FD, 101 keyboard • 1:1 hard drive controller IDE • Desktop case •AMI BIOS • 64 K RAM cache, upgradable to 256K • 1-32/8 bit slot • 6-16 bit slot • 1-8 bit slot • Weitek math co-processor socket.

1999.

Ad expires 9/30/91. Limited to stock on hand. Errors subject to correction.

SIGMA DESIGNS

Sigma VGA Legend

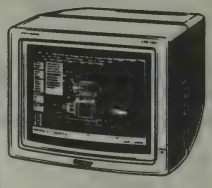


- 1024 x 768 • 16 colors
- Interlaced or non-interlaced
- No switches or jumpers
- 512 K video memory upgradable to 1 MB
- Exceeds European ergonomic standards for flicker-free displays
- Upgrade kits in stock (VGA CARD ONLY)

229.

SONY

Sony 1320 VGA



- VGA color monitor
- Analog input
- .25mm aperture grid

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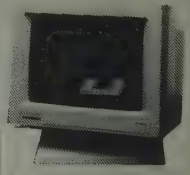
HYUNDAI

HCM-402C



- 14" VGA color
- .31 dot pitch
- Includes tilt & swivel base

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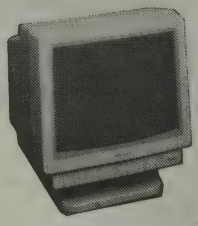
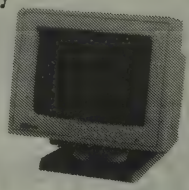


Leading Technology 1458V

14" analog multi-frequency 640 x 480, .51 mm dot pitch

299.



Leading Technology 1480A

- 14" amber flat screen 720h x 350v with tilt and swivel.

119.

NEC

MultiSync 3DS

The NEC 3D is one of the best multiscan monitors made. 1024 x 768 resolution means you can use sophisticated Super VGA software and hardware with this screen.

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Leading Technology 12" Amber Monochrome

- Non- glare • 720h x 350v with tilt & swivel and cable

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MoreFonts

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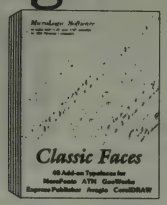
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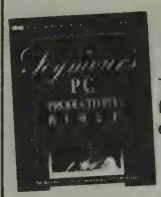

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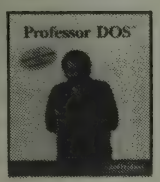

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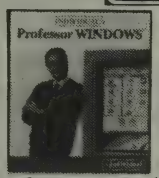

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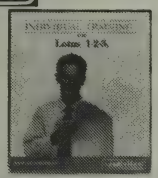

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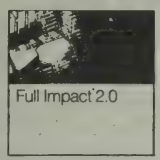

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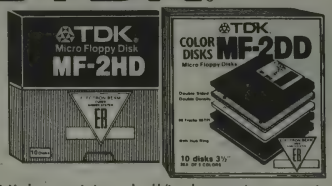

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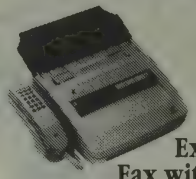

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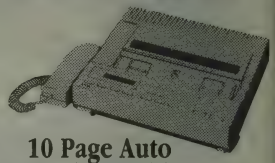

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WHOLE EARTH ACCESS

Continued from page 46

All of these features are pluses for anyone who uses MS-DOS, but there are some features that are particularly helpful for laptop users. The most obvious one is the new DOS shell. This provides an interface between the operating system and the user. For new users, who don't know and don't care to know about C prompts and the like, the shell simplifies your work.

Version 4.x also had a shell, but it was not nearly as useful as this one. While many users have moved over to Windows 3.0, I find that it is not well suited to most laptops which lack the required memory. On my desktop computer, I use DESQview, which I love, but on the road I am generally limited to running in a simple DOS environment. DESQview does things I really miss when I use a portable. Most importantly, DESQview allows me to switch between applications without having to close one down before entering another. This means that I can have my word processor going in one window and then decide to look at a spreadsheet in another window. With the touch of a couple of keys, I can move back and forth between them, having up to seven other windows open at the same time. In addition, multitasking with DESQview lets me have a spreadsheet recalculating in a background window while I am doing another task in the foreground.

While the DOS shell that comes with v5.0 doesn't compare with the power of DESQview or Windows, it will let you open multiple applications simultaneously and permit you to move swiftly between several open applications. Unlike the more powerful programs, it requires a relatively reasonable amount of RAM. If you have a basic portable computer, you can now run multiple applications at the same time. However, there are a few things to watch out for.

The documentation that comes with the upgrade warns that you must exit each application individually when you shut down the system. I had an application lock up the computer and was forced to reboot. When I did some fancy checking, I found that the shell had left a group of hidden temporary files on my hard disk. While it was a troublesome task to find and remove these files, if I had not done so, my hard disk would gradually have become filled with unwanted hidden files. I would like it if someone at Microsoft had found a way to prevent this from happening, or failing that, had provided a convenient way to clean a hard disk of these unwanted files. ■

RESOURCES:

DESQview 386
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Computer Of The Month

The Micro Express NB5620

The prices for laptops have gone crazy. As large manufacturers like IBM and Compaq slash their prices to be able to compete, the clone makers introduce less expensive systems. It used to be that a good notebook computer could cost you as much as five or six thousand dollars. But that has all changed. Nevertheless, the Micro Express NB5620 wins my award for the least expensive machine in its class.

At $1999, you can't beat this machine. This is no entry level model. It has all of the features I demand and weighs only 6.8lbs. including a rechargeable NiCd battery supplying two hours of power. It measures 11.8" x 8.3" x 2" and has a 9" backlit screen. Powered by a 20MHz, 80386SX microprocessor, it also includes a high-density 3.5" floppy drive as well as a 20MB hard drive. You get a nice carrying case with the unit, but you have to buy the operating system (about $75).

Not only does the unit come with a good array of ports and features, but it is also expandable. Although it comes with 1MB of RAM, it can hold up to 5MB with the addition of a memory board ($500 for the 4MB module). Should you require a larger hard disk, both 40MB ($450) and 60MB ($700) models are available as upgrades.

The display is VGA with sixteen shades of gray for color emulation. An external monitor can be easily attached. Likewise, you can add a keyboard of your choice if you are not satisfied with the 83-key built-in keyboard. I didn't like the Micro Express keyboard as well as some of the other models I've tried, mostly because the keys have less travel. If you do not want to add a full keyboard, you can get a numeric keypad ($45) that will allow you to bypass the embedded numbers that I also hate to use.

Although no built-in modem is available, Micro Express has wisely included two serial ports. Today, unless you can add a built-in modem, it is necessary to have two serial ports so users can have both a modem and a mouse on their systems. Surprisingly few manufacturers include the second serial port.

Micro Express has wisely included two serial ports. Today, unless you can add a built-in modem, it is necessary to have two serial ports so users can have both a modem and a mouse on their systems.

Micro Express believes in their systems. They burn them in for seventy-two hours before shipping, and then warranty the units for fifteen months for both parts and labor. The documentation tells you all you need to know, but never mentions either Micro Express or a model number. Clearly, this computer is made by a third party for this vendor. This machine is a pleasure to use and its clean design makes it equally nice to look at. All of the machines that Micro Express sells are returnable for a full refund within thirty days, so this is definitely worth checking out. ■

Intel-Based UNIX

Santa Monica's Interactive Systems Challenges SCO And Microsoft For 386-486 Software Standard

BY YACCO

"In a strategic agreement with UNIX Systems Laboratories [USL] and Intel Corporation, Interactive was named principal publisher of UNIX System V Release 4 (SVR4) for Intel 386/i486 platforms."

—Interactive Systems Corporation press release

If you're a developer planning applications for the coming decade, you might find this a critically important announcement. If you're a system manager in a PC-based office, contemplating your future upgrade path, the agreement may well affect your options.

"SVR4 is really the vision of the future," claims Interactive's CEO, Dennis Peck. "This is the first release of UNIX in which one operating environment has provided Sun, XENIX, Berkeley, and BCS compatibility all in the same package.

I traveled over the forbidding Mulholland Hump, beyond the wilds of Westwood, deep into the parched dunes of Santa Monica, where Dennis Peck is planning to throw some of the local silicon into the smoothly spinning gears of The Santa Cruz Operation—the industry's great commodity-based UNIX machine.

Today, SVR4 is ready for developers, and for large users who will eventually standardize on it. Tomorrow, it will offer what USL/Intel partners such as Interactive hope to establish as the standard to which developers will code. On this supposition hinges the importance of SVR4 to several hundred thousand UNIX installations, and thereby Interactive's hopes for competitive advantage. It may also help to attract some of the forty million or so PC users who might choose UNIX as their next operating system.

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OS WARS: THE BATTLE FOR THE NEXT-GENERATION PC DESKTOP

However, there are other competitors for those users. Those pervasive Microsoft operating systems, DOS and Windows, have far less capability, but together constitute an installed base of as many as forty million—compared to perhaps 800,000 UNIX installations across all hardware platforms. (Windows alone has sold three or four million copies.)

IBM is preparing an OS/2 onslaught against Windows, and UNIX may get caught in the crossfire.

There are others: Metaphor and its joint venture with IBM (Patriot Partners); Microsoft's New Technology. Apple, too, may present a challenge with its quasi-secret, platform-independent Pink operating-system project.

"I think that we in the UNIX world have a tremendous opportunity as we solidify our position," Peck says. "If the Pink operating environment is for real, that's going to be another variant that's taken to software developers. But I think that what's going to happen here is that we can go to the software community and say, 'Write for UNIX.'"

As for the users, UNIX has always offered the advantage of multi-platform portability; its users aren't locked into a single software standard. Peck explains, "A corporation may say, 'I don't want a closed standard that just addresses my PC space. I want an environment that I can use to run all of my systems—not just my PCs, but my servers, and maybe, my larger servers.' To a corporation that standardizes on an environment, that has the vision, that wants to dramatically lower its cost, to improve its flexibility in selecting software, the closed OS/2 offering is not going to be particularly attractive."

One area where OS/2 definitely can't compete with UNIX is in multiuser systems. OS/2 simply doesn't support a multiuser environment. In less demanding applications—order entry and other highly interactive transactions—multiuser systems may allow you to support scores of terminals with a single host. UNIX lets you connect terminals to a PC host via its serial ports. So, aside from the terminals (or emulation software for PCs) the

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Numeric Support	Built-in	Built-in	Intel	Cyrix/Intel	Cyrix/Intel	387SX
8-bit Slot	yes	yes	no	1	2	2
16-bit Slot	6	6	6	5	5	5
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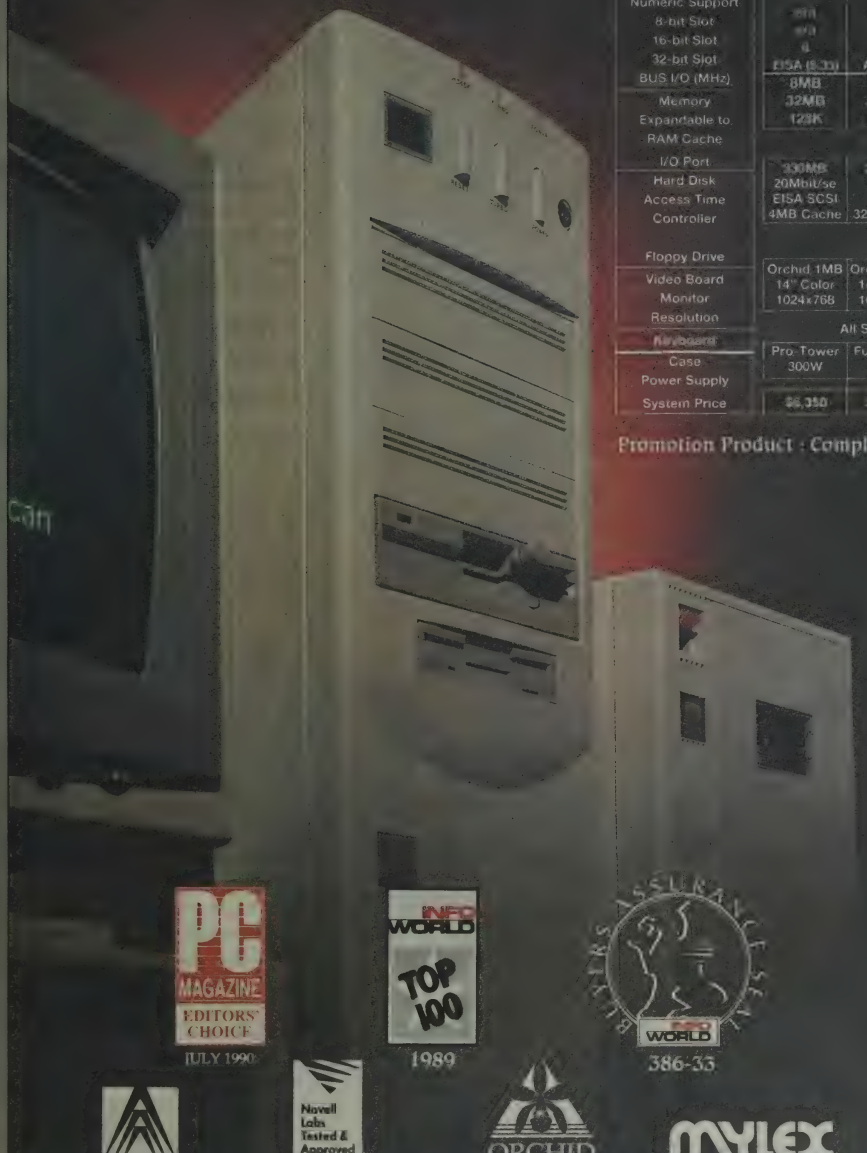

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DTK 486 dependability lets Lightspeed Corp. sell total solutions

Resellers are excited about DTK's line of 486 PCs because of their performance, dependability, and affordability.

"The DTK systems stand up, giving us the ability to include service agreements in our system sales," said Corky Deeds of Lightspeed Corp.

"We almost never need to service a DTK computer," Deeds related. The El Cajon, California, company especially likes the CAD and Lantastic® networking performance of DTK's 486 models.

DTK's traditional price/performance ratio means its resellers can compete with low-end products and still earn good margins. The combination of performance, dependability and affordability allows reseller marketing people to concentrate on solving their customers' problems.

Lightspeed's Sales Manager, Joe London, is proud of his company's approach; "We're not selling products at Lightspeed, we're selling solutions. DTK enables us to sell a total solution."

Users enthusiastic about DTK 486; Praise its price, performance, and compatibility

Whether they're using DTK's 486 for AutoCAD, large databases, or fileservers, computer users are telling DTK, "Well done!"

Two customers of Regal Computers, Inc., the DTK reseller in Rapid City, South Dakota, are lavish in their praise of the DTK 486.

Waste Energy Technology's Ed Cronin needed more computer power to manage his large databases. His decision to invest in a DTK 486 came only after he carefully compared several competing brands.

Cronin's response, after replacing his Northgate computer with a DTK 486, was a single word, "Fantastic!"

Clark Engineering, another Regal customer, needed more muscle for its AutoCAD installation. After analyzing available computer products, Manager Dan Abraham chose the DTK 486.

Regal president Jim Van Loan says his company's emphasis on DTK's 486 line is contributing to his firm's rapid growth.

"It's simple," Van Loan explained, "for performance and compatibility, there is no comparison to the DTK line. When our customer looks at the performance and then the price, there's little more to decide."

DTK 486 performance halves workload for consulting company

A San Diego company is singing the praises of its new DTK 486 computer because it has helped to cut the firm's workload by half.

Ericksen-Rattan Associates helps businesses evaluate various hazardous materials. The company needed power and dependability in a computer to keep ahead of an ever increasing amount of work.

"I'm thrilled with the performance," says Mary Rattan. "Our DTK 486 is impressively reliable and extremely fast. It's paid for itself quickly by allowing us to produce more projects and take on new business."

DTK's ten years' experience in the manufacture of motherboards, add-on cards, and systems makes the company a pioneer in a field where a generation is measured in months rather than years. This experience is reflected in the dependability and performance of DTK products.

Information intensive companies like Ericksen-Rattan Associates are finding DTK's performance and dependability are contributing to an improved profit picture. "I recommend the DTK 486 to any business looking to improve their market position," Rattan concluded.

DTK 486 drives high-performance software in PC Week Labs test.

When *PC Week's* editors asked PC Week Labs to test Autodesk's® Renderman™ software, a DTK i486™ computer was chosen to run the sophisticated, high-level shading software program. (The drawing shown above is representative of the high quality of Renderman™ output.)

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only significant hardware you'll need for a multiuser application are the adapters that support multiple serial ports.

Of course IBM has a different view of corporate computing that focuses on its mainframes—mainframes that aren't running UNIX. And as long as they aren't running UNIX, OS/2 will be in a strong position to link departmental networks through a token-ring backbone.

Certainly, the issue of OS/2's openness is less important to an all-IBM dataprocessing shop. Will General Motors ever break from the mainframe paradigm for its corporate systems? Maybe not, but other large organizations have. Peck points to Wal-Mart and K-Mart, two of the nation's largest retailers. "Those companies have dramatically lowered their support costs and their cost of computing," says Peck, "but at the same time both companies have huge commitments to the value of information. They want to use information as a strategic weapon.

Interactive Systems CEO Dennis Peck: "This is the first release of UNIX in which one operating environment has provided Sun, XENIX, Berkeley, and BCS compatibility all in the same package."

"They're using open systems to better leverage their investment. By going with open systems, by being able to use commodity-oriented hardware—even commodity-oriented software—by forcing the vendors to be very competitive, both companies are gaining a real operational edge."

UNIX also delivers true 32-bit operation for the '386 and '486. Peck says, "The industry is relatively early in delivering full 32-bit operating systems on the desktop. Windows-32 is still under development. System 7 on the Mac is just coming out. OS/2 does not have a lot of market share.

"The only two full 32-bit operating environments that are being delivered in any kind of volume right now are UNIX and OS/2, but OS/2 is still relatively early in its growth cycle. UNIX is one of the only full 32-bit desktop operation systems that's being delivered on commodities."

UNIX AND NETWORKING

Desktop computing is rapidly changing to include more network connections. As it does, UNIX's built-in capabilities make it more competitive with other alternatives.

"UNIX is a great networking platform," says Peck. "It supports the open systems protocols. It supports the prior open systems protocols such as TCP. It supports the distributed file systems NFS. In the PC world, it supports many of the DOS-oriented networking architectures such as Novell through Portable NetWare, or LAN Manager. It can run on a variety of servers that can scale and take advantage of large memory. You can be very flexible. You can be running multiple protocols at the same time.

"UNIX is ideally positioned to be the server in the next generation of applications, which are beginning to be delivered with a graphical user interface. It is wonderfully positioned to be any of a wide range of servers in corporate America. It is wonderfully positioned to be the server and the target environment in a client-server arena.

"The other thing that makes UNIX a wonderful server-oriented environment is the fact that it can take advantage of large memories. It scales. If you begin to run out of horsepower, you can move your applications—even to another chip set—simply by recompiling. UNIX supports multiprocessing. It's being delivered right now. If you begin to run out of horsepower on that server, there are architectures that let you simply slide in a nice low-cost additional processing board—very economical growth in place.

"On the low-order side, it does a great job of supporting X Windows. We can deliver the interface to users that they have gotten used to on the Mac and DOS-Windows. UNIX will let you deliver that interface not only on a personal productivity application, but on a real commercial application: on a bill-of-material, on a production-scheduling, on a next-generation executive information system.

"When we talk about commercial applications, there are far more real applications for UNIX that you can run your business on. This is a sixty-million-dollar company. The entire company runs on UNIX and commodity Intel machines. There isn't anything any larger here than a commodity '486. At Siemens right now, there are a hundred different project teams working on a wide range of applications to run the giant Siemens on. They're all writing these applications to our UNIX."

IF IT'S SO GREAT, WHY ISN'T EVERYBODY RUNNING IT?

However, UNIX has been available for the Intel-processor-based computers, machines Peck calls "commodity" systems, for a long time now without gaining mainstream popularity. There are two principal reasons for this: UNIX is complex; UNIX is expensive.

UNIX is a multitasking, multiuser system. It provides networking and multiprocessor support. That type of system is inherently complex and costly, but these problems have been aggravated by a glut of standards and standards bodies. UI, OSF, USL, ACE, OSA, iBCS-1, iBCS-2, ABI, SVR3.2, SVR4, OSF/1, BSD, X-11, POSIX, C2—only the tip of an alphabet iceberg that is UNIX today. This complexity contributes to higher development costs, and helps make UNIX applications expensive.

Furthermore, the resulting market fragmentation holds back a great deal of potential UNIX development, and reduces the number of applications available to attract users.

Fortunately, the number of standards is being reduced. "We in the industry have done a heck of a lot better than ever before," Peck says of the consolidation movement. A new Intel binary compatibility standard (iBCS-2) will be available in SVR4 within a few weeks. Developers that use it can expect their applications to work with both SVR4 and predecessor SVR3.2 UNIXes (SCO's Open Desktop, for example) on any Intel-based commodity computer. USL partners, including Interactive, are offering features beyond iBCS-2 in SVR4—through a superstandard called ABI—but developers can write to iBCS-2.

"Write for the ABI," Peck tells developers, "or if you really want to write for a level that isn't quite as productive as the ABI, but that spans more platforms, that supports Open Desktop, and supports OSF, then write for BSC-2." He adds, "That is a simpler-to-understand story for the software developer than what's going to come down from all these competing, and somewhat parochially focused, efforts."

That's the advice Interactive has for developers. For users who need a system to run shrink-wrapped applications out of the box, SVR3.2 is the current solution. (Interactive has just decided to extend its buyer-protection plan for SVR3.2. "They can take advantage of that product

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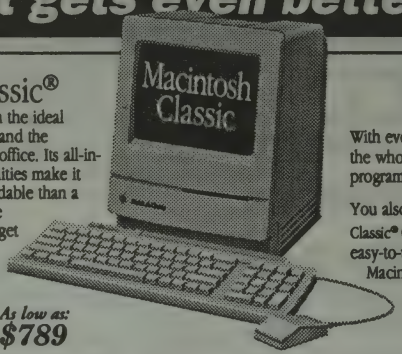

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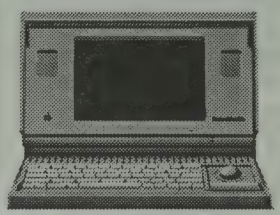

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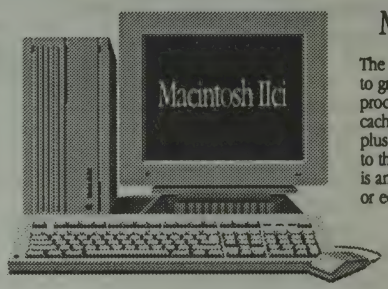

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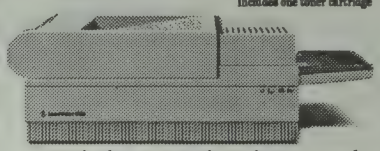

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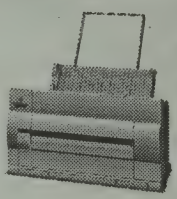

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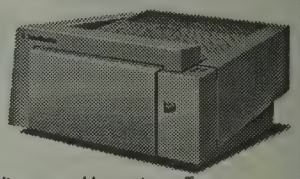

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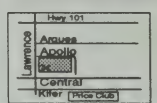

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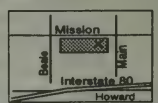

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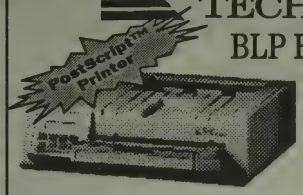

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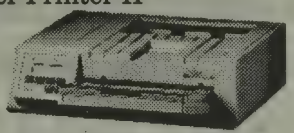

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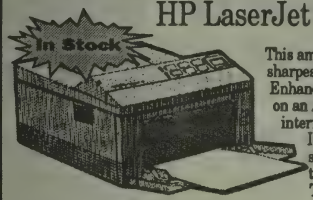

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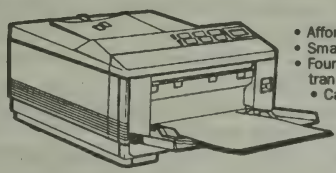

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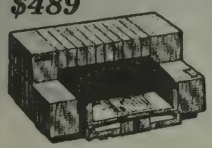

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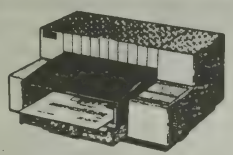

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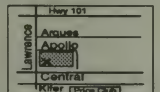

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now," says Peck, "and any time between now and the end of 1992, they can convert that product to SVR4 for $195.") Interactive plans to have all major applications running on SVR4 (through iBCS-2) by year's end.

INTERACTIVE VS. SCO

Interactive was formed in 1977—the first commercial UNIX company. Now, Peck says, "We're beginning to see some real growth. Most market researchers are saying that the open-systems business last year was $30 billion. We plan on growing very aggressively, and being a much larger company."

Historically, Interactive is best known for its UNIX ports of application software: The Norton Utilities, Lotus 1-2-3, and VP/ix are just three of the applications it has helped develop for UNIX. More significantly, the primary v3.2 UNIX product for Intel processors is based on contract work Interactive did for Intel and USL. Interactive has also done major ports for IBM, Hitachi, and Amdahl.

Peck: "To a corporation that standardizes on an environment, that wants to dramatically lower its cost, to improve its flexibility in selecting software, the closed OS/2 offering is not going to be particularly attractive."

Interactive needs all the advantages it can muster to compete with The Santa Cruz Operation, which has as much as 80% of the combined UNIX-XENIX market! Peck claims, however, that most of SCO's market share is in the less powerful software: "The bulk of SCO's base is XENIX. I believe that 650–680,000 is the total base on Intel of all vendors. I think that what SCO has is 300–400,000. XENIX is approaching 300,000, and their 3.2 product, I would estimate, is 60,000 or so. ODT [SCO's Open Desktop, also 3.2-UNIX] is another 15–20,000. ODT is very early in its life cycle, and our partners tell us that it's not shipping in any volume at all."

Peck says that SCO's share of the fully implemented UNIX market is about equal to the numbers that Interactive ships, and that UNIX is inherently superior to XENIX. "UNIX is better in a workstation environment than XENIX. UNIX has Motif or Open Look [graphical user interfaces similar to Windows]. UNIX has more extensive networking than XENIX. With UNIX you would have TCP/IP in a distributed-file-system NFS. XENIX doesn't have X Windows or Motif.

"The market for XENIX was multi-dumb-terminal systems. It's been quite appealing to people in their first generation of commodity-priced micros with glass teletypes running character-oriented applications. And that's really been the positioning of it.

"XENIX has never had POSIX compliance [a requirement of federal contracts]. POSIX implies higher-level C2 security. POSIX implies application interfaces at a higher level. POSIX implies the ability to have an API, to use TCP/IP [network protocol], and things like that. XENIX never had that capability, which the 3.2 UNIXes now have. Three-two UNIXes have good local area networking, they have a graphical user environment, they have extended security, and that has been missing from XENIX."

Nevertheless, SCO's installed base, market share, and distribution channels seem likely to give it an edge over Interactive wherever the two companies compete head-to-head. Jeff Tye, corporate communications officer at SCO puts it succinctly: "Interactive is really good at coming out with new technology. What we're really good at is shrink wrap."

So Interactive is placing a lot of its chips on ABI. SCO has decided not to support SVR4 until the market demands it. If developers choose to write to the ABI, then Interactive's chief competition will be at a disadvantage while it tools up to deliver the new product.

UNIX AND PICTURES?

Another area in which Interactive plans to play a leading role is digital imaging. Its gigantic parent company, Kodak, has a strong interest in developing this technology, because the days of traditional silver-halide chemistry are numbered. By positioning itself in digital imaging now, Kodak will stay in the game for the long term.

"Color imaging is well suited to local area networks, and it's ideally suited to UNIX," says Peck. "We think that digital images will be very important to the way we all do our work throughout the mid- and later nineties. We think that a hybrid solution to that, which is going to be very, very important on the desktop, will be the work that Kodak is doing on photo CD.

"Beginning next year, you'll be able to get CDs from your local photofinisher. All of the software that works with the digital image will be available. We're going to image-and-color enable UNIX so that, right out of the box, you'll be able to take that photo CD and display an image on the screen, zoom, crop, rotate, scale it, print, and copy it.

"We provide software that has been developed by Kodak—and which we will productize for the UNIX world—called Color Management. Color Management enables you to manage the fidelity of the color between the input and display on a monitor or printer so that it looks all the same.

"Our parent company knows how to do that. They have the rules, and we're working on moving this knowledge base to the commodity-priced desktop. Within Kodak, our most sophisticated prepress systems for the commercial printing world—advertising and publishing—run on UNIX right now.

Interactive needs all the advantages it can muster to compete with The Santa Cruz Operation, which has as much as 80% of the combined UNIX-XENIX market.

"Whether you capture the image with your 35mm camera or with a digital camera, we're investing right now in a lot of the tools and the software to manage, to store, to work, and to build products around that digital image. So, we're going to be ahead of the game.

"Right out of the box, SVR4 will come standard with a set of drivers

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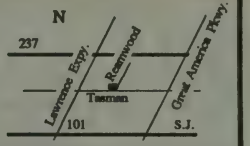

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that support color peripherals, such as scanners, monitors, and optical discs. Output devices might include printers, color copiers, and color faxes.

"Kodak sells a thermal-transfer printer now, the XL 7700, that will print traditional hard copy or foils. It's twenty-something-thousand dollars now, but in the next three or four years, that printer will be less than $10,000. So, we're talking about a full photographic-quality desktop-color-imaging system for less than $20,000.

"We're going to really enable the CD-ROM. We're looking at even shipping an XA unit [CD-ROM player] with our software next year. We plan on bundling it right into the box in '92. Here it comes at a slightly higher price—just to cover our costs. Secondly, we're dialed into Kodak. A lot of people are going to ship software on CD-ROM."

Jeff Tye, corporate communications officer at SCO: "Interactive is really good at coming out with new technology. What we're really good at is shrink wrap."

BUT WHAT ABOUT THE SINGLE USER?

Many of the commodity users Interactive is targeting are individual users, without a need for networking. For them, price is a barrier to using UNIX.

"We have a preconfigured bundle, on our 3.2 product," says Peck, for each of these target user environments: basic operating system, multiterminal, workstation, networking, and software development. Our strategy in pricing is to be very, very competitive with the industry. I think you'll find our pricing is slightly under SCO's."

Despite those assurances though, it appears to standalone users that the UNIX industry is taking a passive approach to the mass Intel market—waiting for commodity hardware users to demand a sophisticated operating system, waiting for them to move up to networks, multiprocessing, and multiuser applications. It is not effectively reaching down to the market for low-cost, easy-to-use systems or the huge demand for personal productivity applications. Meanwhile, DOS-Windows and OS/2 are moving up to offer more sophisticated capabilities to this class of user.

"I don't think the UNIX industry's trying to wait," says Peck. "I think that it has worked out that it is nicely positioned for a very different paradigm in the nineties. We believe that in the nineties users of all aspects of applications are going to demand graphical interfaces. They are going to demand a lot of additional computing resources. Not everyone's going to want to invest in that resource on every desktop, but they're going to need to have access to the resource. That's going to be through networks." ■

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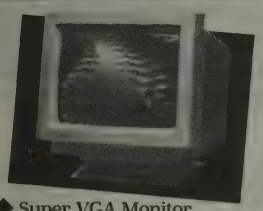

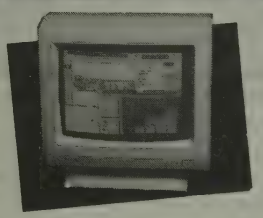

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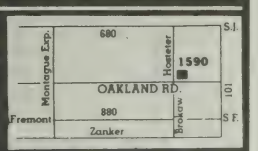


VISA

The Hole Within The Cube

NeXT Software

BY JOHN PERRY BARLOW

At the end of last month's gushingly positive review of NeXT hardware, I promised a look at the general state of NeXT software. And here 'tis. I'm not going to be able to tell you much about any of these packages in the space allotted, and will be leaving some out altogether, but I will be giving them longer reviews in months to come. There's a fair amount to discuss here.

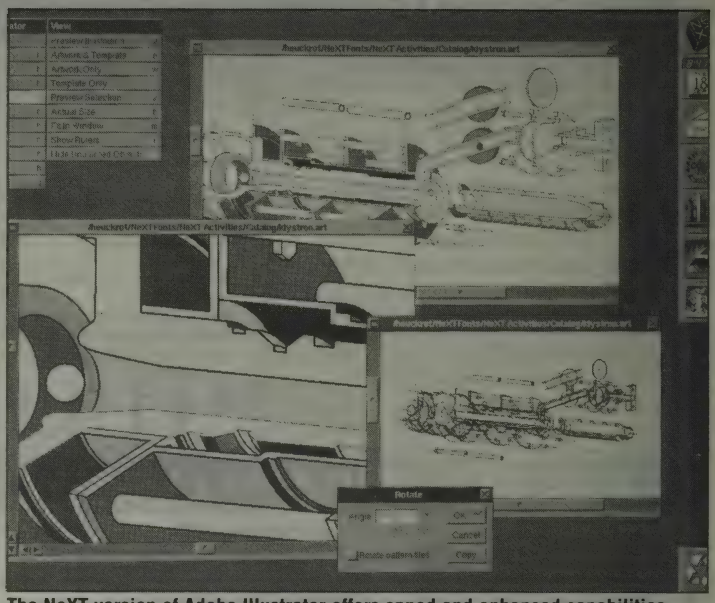
Which is rather the point. There is a widespread belief that one good reason for not buying a NeXT is that there's no software for it. This is not true, though I certainly can see where the idea arose.

There is a widespread belief that one good reason for not buying a NeXT is that there's no software for it. This is not true, though I certainly can see where the idea arose. I've seen this myth erupt before, usually in the general vicinity of Steve Jobs.

Not that it needed a source. I've seen this myth erupt before, usually in the general vicinity of Steve Jobs. (There are *still* people going around saying that there's no software for the Mac.) While the suite of NeXT applications is a bit smaller than the Mac's eight thousand titles, there is actually quite a lot of software available for it, especially considering the youth of the platform.

Furthermore, given the rich variety of developer tools from both NeXT and third parties, as well as the fabled ease of NeXT development, I think we can expect to see a lot more in a short time if NeXT starts selling enough machines to constitute a valid market. And present indications are that it is.

Right now, however, there are only about eighty NeXTstep applications in commercial existence (according to *BYTE*). Sounds grim, but this is a lot more than the thirty or so programs that run under Sun's GUI, OpenLook, and is roughly comparable with the number that actually *use* either the Motif or Presentation Manager interfaces. (Though more will run under OS/2 or X Windows).



The NeXT version of Adobe Illustrator offers spped and enhanced capabilities over the Mac version.

Also, if it will run under Berkeley UNIX, it will run on a NeXT, although it won't partake in the coolness of NeXTstep. Finally, there are third-party emulators which open up other dreary (though software-populous) vistas: with **SoftPC** from Insignia, one can run the entire body of DOS programs, and Pencom's **Co-Xist** allows a NeXT on a heterogeneous UNIX network to run X Windows.

As on other platforms, a lot of the available NeXTstep applications are somewhat specialized. Not everyone has use for a program like **TranScriber**, a piece of software designed to catalog, store, and play back the voices of doctors talking about their patients (Toltec Human Services, 405/840-4254). And it's unlikely that an object-oriented FORTRAN compiler like Absoft's **FORTRAN 77** will ever make the racks at Egghead (Absoft Corporation, 313/853-0050).

But let's consider the kinds of programs that people actually *use*. I have heard from a number of sources that as many as 70% of the small computers in use are PCs dedicated to serving up WordPerfect and Lotus 1-2-3 and little else. If that's all you want, the NeXT has you more than covered with **WordPerfect** for the NeXT and Lotus **Improv** (more about both of these in a moment).

But even beyond the Productivity Solution enslavement of the LotusPerfect techno-peasants, I think it's safe to say that most of us use relatively, few software packages on a daily basis and that most of these fall into a few categories: word processors, spreadsheets, databases, desktop publishing, graphics software, communications software, utilities, and programming tools. Then there is the specialized subset of professional tools like MIDI sequencers and or multimedia tools, of which the NeXT has encouraged a predictable abundance. (And with which I have no personal experience yet.)

In most of these categories, there is, either in existence or genuinely pending, some piece of software for the NeXT, ranging from cases where there is one weak contender in the category to cases where there is either an abundance or a particular application so strong as to make it worth buying a NeXT just to run it.

The following is a general overview of what's currently or about to be available in each of these categories. As I say, I'm leaving a lot out here, but these seem to be the areas that have the most general interest.

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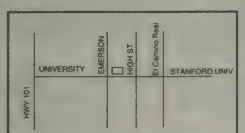

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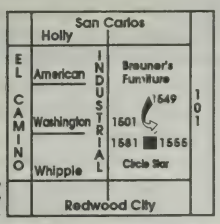

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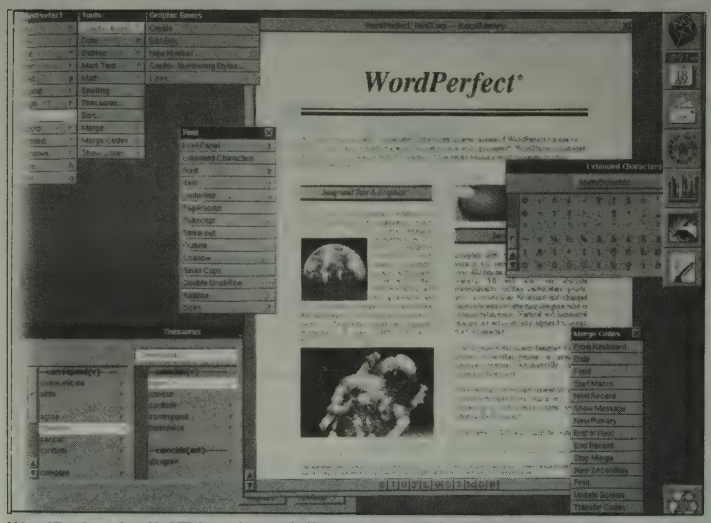
WORD PROCESSORS

Not a very good category...yet. There are two NeXT word processors available (unless you count **FrameMaker**, **EMACS**, **Edit**, or T_EX). They are T/Maker's **WriteNow 2.0**, which is bundled, and **WordPerfect** for the NeXT.



WordPerfect for NeXT is substantially more user-friendly and feature-laden than other versions.

As I mentioned last month, I don't find WriteNow up to all the different things I've tried to throw at it. It's probably great for memos, and it has a certain elegant simplicity, but it doesn't seem very industrial grade.

The big contender here is the big contender everywhere else, WordPerfect (WordPerfect Corporation, 801/225-5000). WordPerfect for the NeXT, somewhat to my surprise, has the capacity to become A Great Word Processor.

I will confess I don't like WordPerfect on any of the other platforms I've used it on. It seems almost perverse in the anti-mnemonic quality of its command structure. Even given the extraordinary sweetness and patience of WordPerfect's 750 support staffers, I still regard its 71% market share to be one of the great mysteries of the age.

But WordPerfect for the NeXT is different. The folks from Orem are really trying to understand graphical interfaces and give every indication that they are starting to ascend from their chronically clue-impaired condition in this area. WordPerfect for the NeXT is a great deal easier to use than any of its brethren, and contains many features, especially in its handling of graphics, which the other versions don't.

But, unfortunately, that's not all it contains. It also features more bugs than a Tenderloin tenement. One can only assume that Steve Jobs was so desperate for credible, sober software from the kinds of credible, sober companies MIS-oids respect that he hypnotized Pete Peterson into releasing the Alpha version. Like most NeXT programs, it doesn't crash that much, but you often find yourself issuing a command without knowing for sure what's going to happen after that.

There is other evidence of a serious rush to market, like the failure to include, in a piece of software which has every other bell and whistle imaginable, an Undo command. Kinda weird.

Part of its problems arise from its traditional code-based formatting, which really doesn't work at all well in a graphical environment; but the people from WordPerfect tell me that they are thinking of taking a fundamentally new approach if that's what it takes.

In general, I have such a sense of WordPerfect's commitment to this product that I'm using it for most of my writing, despite the difficulty of translating its files back to Microsoft Word for the Mac. I think they're going to work at it until they get it right. And then it will be very right indeed.

Meanwhile, I find myself missing Word. I keep hoping that Bill Gates will reconfigure his sense of the NeXT's market-share insignificance into a desire to *own* the market in professional workstation word processors.

SPREADSHEETS

A much more promising area. Here the sample is as good as it gets, including a product which is significantly *better* than it gets anyplace else, **Improv** (Lotus Development Corporation, 617/577-8500).

When I saw the reintroduction of the NeXT last fall, I was especially amazed by the performance of Lotus president Jim Manzi who told the assembled that he had developed Improv for the NeXT because "God" told him to. He really said that.

According to BYTE, there are only about eighty NeXTstep applications in commercial existence. Sounds grim, but this is a lot more than the thirty or so programs which run under Sun's OpenLook, and roughly comparable with those that actually use either the Motif or Presentation Manager interfaces.

But watching the Improv demo which followed, I began to wonder if in fact something fairly miraculous hadn't taken place. At last here was a *really different* spreadsheet. One which could be fundamentally reconfigured without starting from scratch, and in which one rarely had to worry about the errors which result from peering into the alphabet soup of one's formulae and having no idea what they do or what they do it to.

I was so impressed that I wondered if the NeXT wouldn't become, in many offices, a dedicated Improv server, much as the Apple II had been a VisiCalc machine and the IBM PC was (and is) usually devoted to running Lotus.

Given the incredible percentage of global CPU cycles which are doing nothing but levitating spreadsheets, it is not ridiculous for a company to buy a particular computer because it's the only one that runs a certain spreadsheet. If that spreadsheet is good enough, that is.

And, if spreadsheets are what you do for a living, Improv is certainly good enough to risk asking your boss to buy you a NeXT. It is also, I must confess, somewhat challenging to learn if you have spent time with one of its predecessors. It is very different. I can't tell whether it's actually unintuitive or just seems so because it's so alien, but there is a bit of a cliff at the base of its learning curve.

If you prefer the known quantity of a traditional spreadsheet, you have a good alternative in **Wingz** from Informix (415/926-6300). I tend to think that Wingz, with all of its graphics, scripting, and presentation tools, is as good a spreadsheet as there is. And the NeXT version makes full use of the graphical environment. Generally, if you liked Wingz on a Mac, you'll love it on a NeXT.

DATABASES

At least on the level where I can claim any informed awareness, this is a considerable and inexplicable hole. The NeXT seems like a natural database server to me. It's fast. It's easy to develop for. It offers very large and reasonably priced hard disks. And it was designed to be on a network. But if there's much going on in this area, it's not on a level which is visible to me.

Both INGRES (415/769-1400)and Sybase (415/596-3500) offer NeXT software. INGRES offers the **INGRES Relational Database Management System v5.0** and Sybase has its **SQL Server**. I've never been around either of these programs on any of the platforms they run on, and I wouldn't be competent to evaluate them if I had. They sound credible to me, but I haven't heard of any corporate DMBS development on the NeXT going on.

There are a number of specialized databases like Imagine, Inc.'s **MediaStation 1.5** for multimedia (Imagine, Inc., 313/487-7117), Toltec's **UNIX MUMPS 3.1** (is that a

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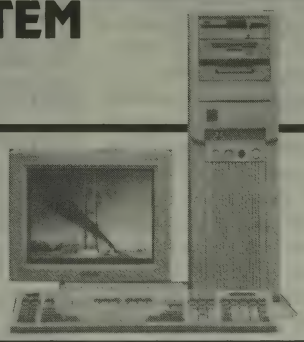

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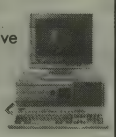

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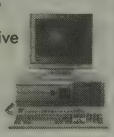

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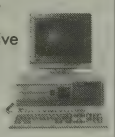

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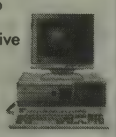

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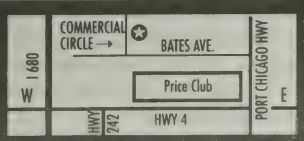

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name or what?) for large-volume medical records (Toltec Human Services, 405/840-4254), and Virginia Tech's VTLS **InfoStation 2.0** for accessing and authoring large electronic libraries (Virginia Tech Corporate Research Center, 703/231-3605). Haven't tried 'em out. Can't say I'm likely to.

What the NeXT needs and does not have at present are the kinds of databases most individuals and businesses use. It needs a medium-duty relational database like FoxBase, and it could use a good flat filer like FileMaker Pro on the Mac or Q&A on the PC. If the former is in the pipeline, I'm not aware of it. Whether it is or not, it should be.

The latter need, however, is close enough to being filled that I have been using a beta edition for some time with increasing confidence. This is a product by the estimable Andrew Stone of Albuquerque's Stone Design (505/345-4800) called **DataPhile**. DataPhile is a swell little flat filer, easier to use and faster than FileMaker Pro (which it somewhat resembles), very versatile, and graphically capable. It can catalog sounds or graphics, and features easy export and import, WYSIWYG reports, and envelopes and labels.

I'm glad it's not on the market yet. In its present state, it continues to suffer occasional instabilities, interface flaws, and missing features (like calculated fields), but when it hits the market later this year, it should cover the database needs of most individuals and small businesses quite well.

DESKTOP PUBLISHING

There has never been a better machine for desktop publishing than a NeXT. Although somewhat reduced by the display ratio, what you see really *is* what you get. Rather as you'd expect with Display PostScript. Furthermore, it has enough speed to snap through the complex screen redraws which seem to go with DTP. And its printer can spit out 400dpi proofs at a rate which is sometimes as much as thirty times faster than a LaserWriter NTX.

But, amazingly enough, there's not much DTP software yet. At least not for me. At the moment, **FrameMaker 2.0** is the only real contender in this area (Frame Technology Corporation, 408/433-3311). But it's not, in my opinion, a page layout program. It's more like dedicated technical textbook software.

Now I recognize that a lot of people—mostly of a certain technical inclination—think that FrameMaker 2.0 is the greatest thing since the propeller beanie. And if I wrote technical documentation for Lawrence Livermore Labs, I would probably be among them. Because there's simply nothing better for laying out scientific and engineering documents.

But this is no program for making an invitation for your kid's birthday party (and lot of this gets done in corporate America) or even a departmental newsletter. The word "frame" implies a certain rigidity which is appropriate here. You can't even do wrap-around graphics with it.

It is not ridiculous for a company to buy a particular computer because it's the only one that runs a certain spreadsheet. And, if spreadsheets are what you do for a living, Improv is certainly good enough to risk asking your boss to buy you a NeXT.

What's most frustrating about it is the little heed it pays to the NeXT environment. It largely ignores the sensible interface standards and requires its users to perform major surgery on their fonts if they wish to use any other faces than the ones which come on the NeXT.

For such purposes as newsletter or non-technical book production, WordPerfect is probably the better DTP package, and indeed it's quite capable of most of the things like columns, kerning, graphics wrap, sidebars, and bordering which most people are likely to use.

Another partial option in this area is Adobe's soon-to-arrive Illustrator 3.0.

But for the moment, there's nothing like PageMaker, XPress, or even Ventura on the NeXT, though I have heard rumors that Quark, at least, is working on a NeXT port. I certainly hope they are. It's wasteful not to use this machine to its capacities as a publishing tool.

GRAPHICS

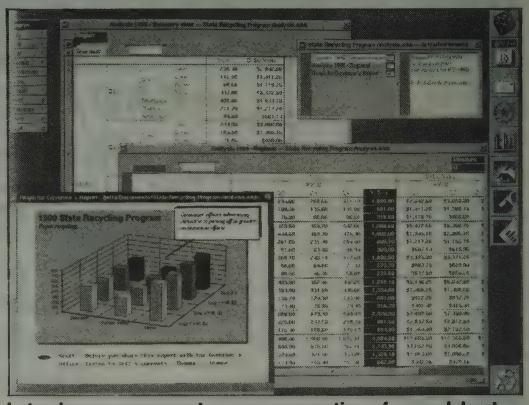
In the area of presentation graphics, the NeXT should disappoint no one. Both Improv and Wingz have a rich set of 2- and 3D numerical graphic options, as well as a complete set of tools to enhance them with.

But the real contender in this area is the soon-to-be-released **Adobe Illustrator 3.0** for the NeXT (Adobe Systems Incorporated, 415/961-4400). The NeXT's speed, color handling, and Display PostScript go extremely well with Illustrator, which appears quite similar to its Macintosh equivalent.

Right below the surface, things are very different. One can actually edit in preview mode with little noticeable wait for redraws. Printing is also a very different story. (One complex drawing which took 16 minutes and 32 seconds for my SE/30 and LaserWriter NTX to print emerged from the NeXT printer in 29 seconds flat.) Color fills, blends, and separations are, with a NeXTdimension board, the fastest and richest PostScript color there is.

If PostScript drawing is what you do, Illustrator for the NeXT is an extremely good reason to sell your Mac and buy a NeXT. Like Improv, Illustrator should sell a lot of machines.

Andrew Stone (505/345-4800) is also responsible for a pair of great graphics programs for the NeXT, **TextArt** and **Create**. The first of these is currently available and is of similar purpose to Mac programs like TypeStyler or TypeAlign. The resemblance ends there though. TextArt can do just about anything that's moral to a PostScript letter. And it does it all onscreen where you can watch it happen.



Lotus Improv represents a new generation of spreadsheet.

Create (which should be released sometime later this summer) has all the functions of TextArt, as well as many of the PostScript drawing tools found in Illustrator. Both programs are extremely intuitive and rapid. Despite their complex range of tools, I was able to learn them both without documentation.

Another worthy text manipulation program is **TouchType** by Glenn Reid of Right Brain software (415/851-1785). While very specific—it is for kerning, rotating, and leading large type, period—you can easily make some very pretty headlines with it.

Even more specific of purpose is a NeXT-related program from Altsys (214/680-2060) called **Metamorphosis Pro.** This can turn any sort of Mac PostScript font into a NeXT (or TrueType) font. I mention this because I can imagine a lot of people hesitating to move their graphics or publishing operation from the Mac because of the font investment they will leave behind. While the documentation didn't cover all the steps in making a NeXT font from a Mac font, it works very well once you puzzle it out.

There is another drawing program called **TopDraw** from MediaLogic (213/453-7744). I've heard some good things about it, but I haven't had a chance to look at it yet. Another graphics program I've only heard praise for is **Diagram!** by Lighthouse Design (301/907-4621). This seems to be for making org and flow charts and other sorts of diagrams with complex "rubberbanding" connecting their elements.

Beyond this point, things thin out rapidly. There is, at present, no paint program for the

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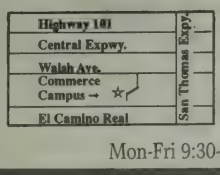

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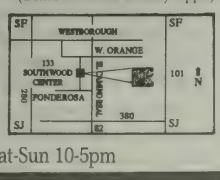

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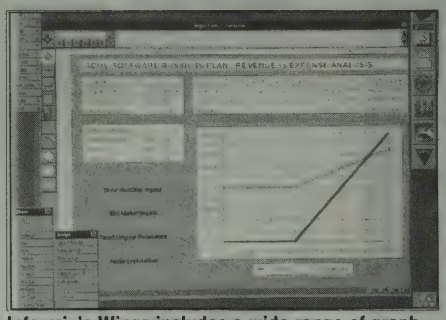
NeXT unless you count Icon and Scene, which are, respectively, a TIFF manipulator and viewer, and come bundled with it.

There is also nothing like Adobe's Photoshop for the NeXT, though it would seem that its speed, display resolution, NeXTdimension board, and optical drive all make it a highly appropriate platform for this kind of program. I'm told that MediaLogic is preparing a similar program called **Artisan**, but I haven't seen it.

Finally, there are, as yet, no CAD programs for the NeXT, though it certainly seems like an ideal environment for them.



Informix's Wingz includes a wide range of graphics and programming tools.

COMMUNICATIONS AND CONNECTIVITY

In one sense, the NeXT is a communications device without any software but the UNIX on it. Through UUCP and tip, one can connect a NeXT either automatically to another UNIX machine, or manually through a dial-up using the Terminal. Things get dicier as soon as you want to do a file transfer or change the rate at which you paste text to the modem, etc.

For this, one needs communications software and, right now, there isn't any. (Actually, there is some shareware called **IComm** by a University of Texas student named Pow Hwee Tan which has been keeping me in ZMODEM, but MicroPhone it ain't.)

Meanwhile, I've been hearing assurances from the folks at Software Ventures (415/644-3232) that **MicroPhone II** really is shipping any day now. I'm starting to believe them, and given the virtues of this program on the Mac, I'm looking forward to it.

There are a number of connectivity packages for such purposes as mating NeXTs with mainframes, but I haven't used them and am not about to start.

Actually, I find the most interesting software in this general vicinity to be Insignia's **SoftPC** (Insignia Solutions, Inc., 408/522-7600). I have used SoftPC on the Mac for a long time, and have generally found it too slow to be practical for anything but emergency support to those benighted friends who still labor in the Purgatory of DOS.

The NeXT version is a whole other story. For one thing, it's fairly fast, usually turning out a Norton SI rating around 12.5, equivalent to a 12MHz 286. For another, it's possible to run a number of virtual PCs simultaneously, cutting and pasting between them. This may be a kludgy way to achieve true DOS multitasking, but it works and it's the only one I'm aware of.

It's not much use for Windows yet—the graphical translation overhead is very high and it runs only a little better than it would on an XT clone—but the folks at Insignia tell me they are working on something intriguing in this area which may soon give us one of the fastest Windows machines on the market.

Generally, though, if you're told that you can't have a NeXT because only PC compatibles are allowed in your office, you bear down and say that it'll run DOS just fine, thank you, in addition to all the other truly *useful* things that it can do.

There are also rumored to be several folks working on a Mac emulator for the NeXT, and I wish them every good fortune in their endeavors.

Until they succeed, there are two methods for Mac connectivity. The first, Ethernet, I'm too ignorant to discuss intelligently beyond saying I know of some Macs and NeXTs which normal humans connected successfully using a Cayman **GatorBox** (Cayman Systems, Inc., 617/494-1999).

The second is **FloppyWorks** from DIT (505/662-1459). This makes it possible for either Syquest or floppy drives connected to the NeXT to read Mac-formatted disks. The software can also be set up to do fairly minimal translation as files are copied one direction or another.

There remains a world of X Windows and SLIP emulators with which I intend to become familiar soon and about which I'll keep you posted.

UTILITIES

This category, so abundant in Mac and PC software, is practically bare on the NeXT. Part of that is the result of the fact that the NeXT doesn't have much need of third-party utilities—for one thing, it contains the Mother of All Utility Collections, UNIX. For another, a lot of the sorts of things one might buy for a Mac or PC are either built into the NeXTstep or simply unnecessary here. Finally, these things seem to grow, organically, into the ecological niches open to them. The NeXT software ecology is still Pre-Cambrian and will be for about another year.

But in the meantime, I don't find myself missing, for example, the best-selling Mac utility, Symantec's anti-viral SAM. That's because I have yet to hear of a single NeXT virus.

One complex Illustrator drawing which took 16 minutes and 32 seconds for my SE/30 and LaserWriter NTX to print emerged from the NeXT printer in 29 seconds flat. If PostScript drawing is what you do, Illustrator for the NeXT is an extremely good reason to sell your Mac and buy a NeXT.

The only NeXT utility I've used is a compression, archiving, and backup program called **Squash** from the wonderfully named Agog, Inc. This works as well as any of these I've seen and as painlessly. Tonight, as I was writing this article, I had it compressing my LocalApps directory in the background. It took it about an hour and a quarter to reduce a 90.1 meg directory down to 30 megs. It also has a number of cool features, like the ability to scan designated folders for files older than a certain age and squash automatically the files you're not using.

PROGRAMMING TOOLS

The largest chunk of the NeXT software catalogue lists development tools. While I don't consider myself competent to review them, their proliferation tells me that engineers love this machine and will use those tools to make a lot of software if the marketoids ever see fit to unleash them.

WHAT'S MISSING

Obviously, one can infer from the above that there's still a lot missing from the NeXT software catalog. Even the categories which are strongest, like the spreadsheets, could use the invigorating effects of more competition. And some categories, like color painting programs, are flat empty.

Personally, aside from Microsoft Word, it's the little things I miss most. I miss a macro program like QuicKeys. Although DataPhile will probably replace it, I miss QuickDEX so much that I've turned my Mac into what amounts to a dedicated QuickDEX server and am lugging it around in that capacity. I'd sure like an application menu such as is provided by either OnCue or System 7. I want more seamless file translation between Mac and NeXT data.

I really miss OnLocation, with its ability to find files all over my Mac's hard disks almost instantaneously. The NeXT Finder doesn't. I miss desk accessories like a full-function calculator or that thing that throws the I Ching. I miss the megabytes of foolish sounds I had programmed to run randomly as beeps. I miss screen savers like After Dark's flying toasters.

BUT...

If I continue in this vein, we'll both start wondering why I've switched to a NeXT. The answer is that for all the software that hasn't frothed up yet, the stuff which has is deep and fast. Every time I go back to my Mac now, I feel like I'm watching paint dry. There may be more paint to dry there, but boredom is boredom. And I am convinced that just as the deficiencies of the hardware were fixed, so will the holes in the software array be patched. And soon.■

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2149-35	3.75	1024x4
2147-3	3.75	4096x1
20C71-25	6.75	4096x4
6168-45	3.25	4096x4
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6116LP3	2.75	2048x8
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6264-10	4.75	8192x8
6264-15	3.75	8192x8
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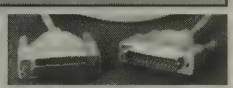
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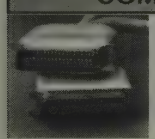
COMPUTER CABLES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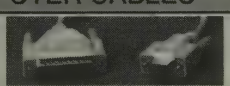
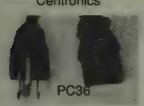
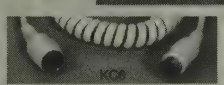

SMC6


PC36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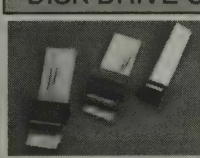
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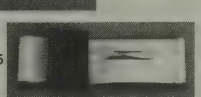
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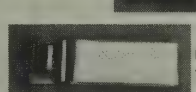
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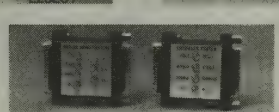
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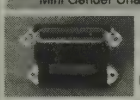
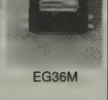

EG36F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Microsoft's DOS 5: Should You Upgrade?

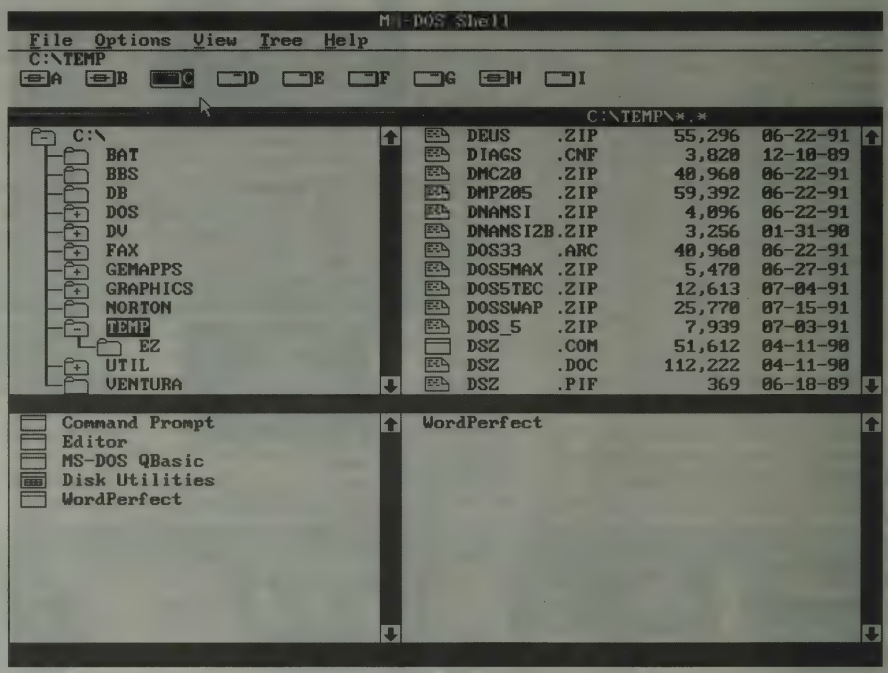
New Features Deliver Ease Of Use And More Power

BY LENNY BAILES

After more than six months of intensive beta testing, Micro-soft's DOS 5 is now available. Reviewers consistently maintain that this is the most significant DOS upgrade in five years.

The question still remains for individual and corporate customers: Do you really need it? Are the new features of DOS 5 worth the time and trouble to upgrade your computer?

The answer may depend on your current level of DOS sophistication and on your investment in third-party enhancements for the DOS you already own. DOS 5 provides many new features and improvements over DOS 4.01, but the depth of these improvements is less than what you get in third-party enhancements for older DOS versions.



IMPROVEMENTS

DOS 5 is definitely an attractive package for a "first computer" or for someone who doesn't already own a lot of utility software. In one package, DOS 5 provides:

•**A user-friendly interface:** Microsoft's DOSShell gives you an application menu, menu-driven file management, and task switching between applications.

•**A rudimentary online help system:** If you add /? to a command, you get a brief screen listing of parameters and options. This works for all internal and external DOS 5 commands.

•**Extended and expanded memory management:** With DOS 5, users of 286 and 386 machines have the option of loading the DOS command kernel into extended memory. This increases conventional memory size by up to 64K. The basic features of memory managers like Quarterdeck's QEMM and Qualitas's 386Max are now included with DOS. Utilities and device drivers can be loaded into "upper memory blocks" (the area in the first megabyte between 640K and 1MB).

•**Improved file utilities:** Standard DOS commands like Append, Attrib, Backup, Dir, Format, and Mode now have added user options. The Backup program can now pause to let you format diskettes. Dir includes a series of options to display file directories by filename, date, size, time, or reverse order. The Format command now has clear syntax to let you format 360K, 720K, 1.2MB and 1.44MB diskettes. Format can be either destructive or nondestructive. The new Unformat utility can recover a diskette that has been formatted nondestructively.

Unformat, Undelete, and Mirror are utilities licensed from Central Point's PC Tools package. Together they provide users protection from accidental file erasure or hard disk corruption.

The new Doskey utility lets you create aliases and keyboard macros. Doskey allows redisplay and editing of the command line history. Doskey is extremely useful for automating repetitive, rote command line tasks. If

DOSShell allows you to set up an interactive interface with online help options. This should be a considerable aid for consultants setting up "first computer" systems for their clients.

"Lenny Bailes is a teacher and consultant in the Bay Area. He has been writing about microcomputers since 1987. Currently he's writing a book on PC memory management and can be reached via the Internet at jroe@well.sf.ca.us, or at 415/285-6232."

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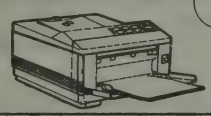

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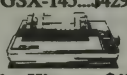

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you must constantly combine files, redirect file output to disk, or perform selective copy and delete operations, Doskey gives you access to any command entered during your session. You can reissue or edit complex commands, write them to a batch file, or set up a sequence of commands as a one- or two-letter macro.

DOS 5 also (finally) provides a full-screen text editor to replace Edlin.

Although you can't find a third-party product on the market that combines all of these features, enhancement packages offer more depth of features in specific single categories. PC Tools and the Norton Utilities offer more file management and recovery tools; QEMM386 and 386Max give you more memory management; 4DOS, a shareware replacement for the DOS command processor, provides more extensive online help and a more powerful batch language. 4DOS, in fact, is the basis for NDOS, the enhanced command processor featured in the new release of the Norton Utilities.

With DOS 5, users of 286 and 386 machines have the option of loading the DOS command kernel into extended memory. This increases conventional memory size by up to 64K. If you run Microsoft Windows and require large disk partitions, this is reason enough to upgrade to DOS 5. You bypass the bugs and limitations of DOS 4, and obtain complete Windows compatibility.

MAKING THE UPGRADE DECISION

A canny user might consider several factors in making an upgrade decision:

•**Upgrade Paths:** Because DOS 5 was subjected to large-scale beta testing, it is a stable release. DOS 4 was a bug-ridden release that cost many people time and money to install and keep running. The upgrade to DOS 5 will cause fewer compatibility problems than the upgrade to DOS 4. You probably won't need to buy subsequent fix-up versions.

Candidates for a DOS 5 upgrade will probably fall into two main groups: those who currently use DOS 3.2 or DOS 3.3 and those who currently use DOS 4.01. These groups may further be subdivided into the users who already own memory managers, file managers, and disk utilities, and those who don't.

DOS 3.3 is the most widely used and stable version of DOS. Its limitations include smaller hard disk partitions and lack of a file management shell. DOS 3.3 also lacks memory management utilities. Owners of 286/386 machines with more than 1MB of RAM must use third-party software to access all of their memory.

DOS 4.01 from Microsoft is fairly stable now, but it has some annoying quirks. For one thing, it consumes 15K to 20K more RAM than DOS 3.3. For another, the file sharing utility, Share, must be loaded at bootup, further decreasing available memory. The memory management utilities included with DOS 4.01 are nonstandard and not very useful. Microsoft's first version of the DOSShell is not as well conceived as the one in DOS 5. The DOS 4 Shell has a confusing interface and is difficult to customize. Nor will it task-switch between applications.

Hard Disk Support: Many users of DOS 3.3 circumvent disk partition limitations with third-party utilities like Disk Manager and Speedstor. (Compaq's DOS 3.31 is also popular for its built-in support of partitions larger than 32MB.) Both DOS 4.01 and DOS 5 support disk partitions larger than 32MB. The advantage of using DOS to create the partitions is better application compatibility. You don't need special device drivers in your config.sys to recognize extended partitions. Disk Manager and Speedstor-created large partitions are only partially compatible with some applications.

Microsoft Windows is crippled by third-party partition schemes. Some disk caches and disk utility packages may fail to work properly with Disk Manager or SpeedStor. If you run Microsoft Windows and require large disk partitions, this is reason enough to upgrade to DOS 5. You bypass the bugs and limitations of DOS 4, and obtain complete Windows compatibility.

File Management: The DOSShell program included with DOS 5 is a definite improvement over DOS 4's shell. The interface is similar to Microsoft Windows. On a VGA system the DOSShell can be run in 43-, 50-, and 60-line text and graphic modes to display twice as much on-screen information. The DOS 5 shell allows the user to do file maintenance from menu options and set up menus to run applications and utilities. The shell is preconfigured with useful menu options for new users. Novices will be able to back up a hard disk, check memory usage or format a diskette without reading the DOS manual and learning the command syntax. DOSShell allows you to set up an interactive interface with online help options. This should be a considerable aid for consultants setting up "first computer" systems for their clients. DOSShell also lets users open and switch between multiple applications. The dormant programs are swapped to disk or to extended memory.

Memory Management: The new memory management tools included in DOS 5 make it possible to keep 600K–630K of memory free after the system boots up. The DOS=High option entered into the config.sys relocates the system startup files and command.com kernel from conventional memory to what Microsoft calls HMA (High Memory Area). HMA is the first 64K of extended memory. Several years ago, Quarterdeck Office Systems discovered that they could make DESQview use the first 64K of extended memory to execute program code. Microsoft has picked up on this feature and followed DR DOS's lead in allowing the system files to run up there, too.

The new 386 expanded memory driver supplied with DOS 5 is fully EMS 4.0 compliant and also provides the ability to "load high" device drivers and utilities. Load high isn't exactly expanded memory; instead, it allows device drivers and utilities to store program code in expanded memory, but tell DOS that the programs are installed in the area between 640K and 1MB. In addition to the memory saved by loading the DOS system files into HMA, using "Loadhigh" saves more conventional memory.

Microsoft's load high feature is only available on 386 machines. Users of 8088/286 machines can obtain this feature through third-party software like Quarterdeck's QRAM and Qualitas' Movem'. (DOS 5 has no support for expanded memory on 8088/286 machines.)

Quarterdeck and Qualitas also offer 386 load high capability with their 386 memory managers. The advantage of third-party load high utilities is that they will automatically analyze your config.sys and autoexec.bat and shoehorn as many programs above 640K as possible. With DOS 5, you may discover that some of your device drivers don't load high, even though there's room for them. You'll have to manually rearrange your config.sys by trial and error if you want to squeeze out every last KB of conventional memory.

The memory management tools included with DOS 5 are good enough to handle basic configurations on a 386. They don't provide advanced options such as sorting RAM by speed, assigning temporary EMS handles, and loading drivers at specific addresses. If you use EMM386 to load device drivers above 640K, you also forfeit the ability to run Microsoft Windows in Standard Mode. (Quarterdeck's QEMM permits you to load high and retain Windows' Standard Mode option.)

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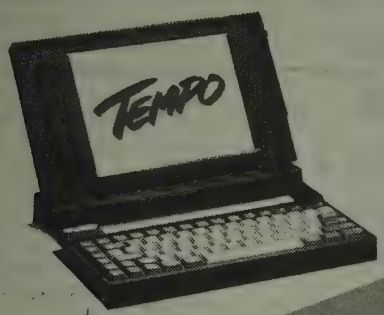

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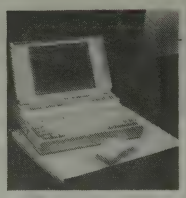

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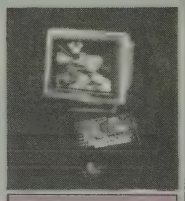

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WHAT ABOUT DR DOS 5?

A good many of the options featured in MS DOS, v5 are also available in Digital Research's DR DOS. DR DOS has equivalent online help options for commands, allows DOS to be placed in the HMA area, and also allows utilities to be loaded above 640K. DR DOS has a graphic file management shell called ViewMax, based on DRI's older GEM Desktop.

The disadvantage of DR DOS is that it was written before the advent of Microsoft Windows. Users who want to run Windows in Standard or Enhanced Mode must add Microsoft's HIMEM.SYS to their config.sys, and may need to tinker with DR DOS's memory management to keep everything running smoothly.

If you want to work with DOS 5 before installing it on your hard disk, you can boot it from a floppy while your hard disk remains formatted with DOS 3 or 4. (Unlike the reverse procedure, this is safe.)

DR DOS does offer some features not included in MS DOS 5. It allows you to pick and choose the device drivers and programs you want loaded in your autoexec.bat and config.sys. DR DOS permits the system files and command kernel to be loaded between 640K and 1MB as well as in the HMA area above 1MB. Users of Quarterdeck's DESQview may benefit from this feature, since DESQview wants the HMA area for itself.

DR DOS does not contain Undelete and Unformat utilities, though it does support disk partitions larger than 32MB.

TIPS FOR EASING INTO DOS 5

If you want to study the effects of MS DOS 5 on your hard disk/working environment without making a commitment, you have several options.

When you install it on your hard disk, DOS 5 creates an uninstall diskette. You can return to your previous DOS configuration by running the uninstall procedure. Once your hard disk is formatted for DOS 5, you should be wary of booting DOS 3 or DOS 4 from a floppy. Because of differences in the way DOS 5 writes to disk, booting from a DOS 3 or DOS 4 floppy can cause data errors for files saved to the hard disk.

Don't use old disk optimization or compression software with DOS 5 installed on the hard disk, unless the manufacturer of the compression software verifies compatibility. Reports have been posted on public networks from users who've trashed their hard disks optimizing with Speed Disk from Norton Utilities, v5.

If you want to work with DOS 5 before installing it on your hard disk, you can boot it from a floppy while your hard disk remains formatted with DOS 3 or 4. (Unlike the reverse procedure, this is safe.) You can get a fast startup, even with a floppy boot by calling all of your device drivers and utilities from the hard drive. After you install DOS 5 on floppies, create a DOS 5 directory on your hard drive and manually copy the essential utilities to it. Here's a sample config.sys and autoexec.bat you might run from the floppy.

Config.sys

```
Device=C:\DOS5\HIMEM.SYS
Device=C:\DOS5\EMM386.EXE RAM
DOS=HIGH, UMB
Devicehigh=C:\util\mouse.sys
Files=30
Buffers=30
```

Autoexec.bat

```
Set comspec=c:\dos5\command.com
path=c:\dos5
c:
auto5.bat
```

"Auto5.bat" on drive C should contain all the commands you would normally run in your autoexec.bat. ■

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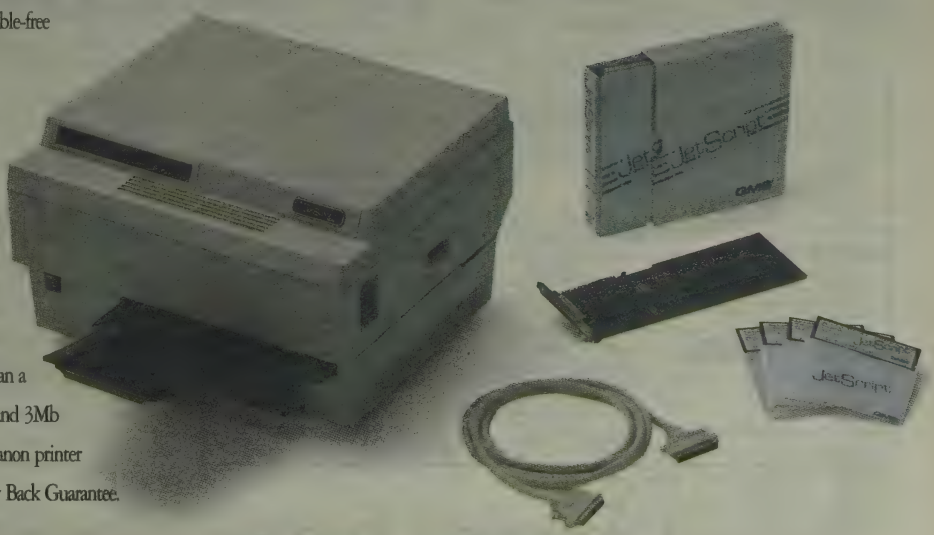

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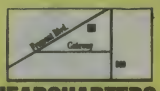

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Do You Really Want UNIX Running On Your PC?

You May Be Able To Get The Performance And Features You Need With A Smaller, Less Expensive Product

BY PAUL HOFFMAN

Given that this issue's cover story is about running UNIX on PCs, the question of why you'd want to do such a thing may be heretical, but it's important to ask. Many people who think they want to run UNIX can, in fact, run other programs that mimic UNIX and save a huge amount of money, time, and aggravation. If you're thinking about installing UNIX on your PC, you should seriously consider the alternatives first.

UNIX BY PARTS

Most people think of UNIX as a huge, monolithic operating system, but in fact it's a loose amalgam of parts. There's the core operating system, which has inherent abilities to multitask and handle multiple users. There's the user interface, with commands very different from MS-DOS. There's the set of utilities that help programmers create and optimize programs. There are invisible network extensions, and multiuser programs that can run across networks. And so on.

If you're currently a PC user, it's likely that you only need a few of UNIX's myriad of features. Many individual UNIX features are available as programs that run under MS-DOS. Buying these programs saves you the agony and cost of changing over to UNIX and allows you to keep your current MS-DOS environment.

For example, you may work at a company that's switching over to UNIX programs that require the X Windows operating environment. You could install UNIX and X Windows on your PC, or you could buy a package that runs X Windows under MS-DOS, such as DESQview/X. The latter course is much simpler, usually cheaper, and allows you to avoid dealing with the learning curve for the rest of UNIX.

JUST THE SHELL, MA'AM

The vast majority of people who want UNIX actually want just the UNIX shell, your interface with the operating system. There are actually many UNIX shells, but the two most common are the C shell and the Bourne shell. A third shell, the Korn shell, is also popular. These user interfaces have many more features than MS-DOS and give power users much more flexibility in file handling.

If you work at a company where many people use UNIX, you may be interested in one of the UNIX shells, because it will make your work environment look much like that of your coworkers.

UNIX shells are also used for batch programming. This is similar to MS-DOS's batch command language, but the UNIX shells' batch programming is incredibly more powerful. Since the shell programming languages have many more options, it is easier to write scripts that do exactly what you want without resorting to batch file add-ons.

If what you want is just the UNIX interface, you should definitely not buy a full UNIX system. Instead, buy one of the many shells that are available for MS-DOS. These shells replace the familiar "C>" prompt with the prompt for the shell and use all of the shell's features. For example, it is easier to format file listings using the UNIX shells than with the MS-DOS DIR command. Some shells are available as shareware, and some are in the public domain.

Another common desire for MS-DOS users who also use UNIX systems is to be able to use "vi," the editor, on their PCs. There are over a dozen versions of vi for PCs, some of them shareware. It seems to be the most pervasive editor known, possibly used more extensively than WordPerfect. Many implementations of vi have extensions to make them even better on the PC, such as the ability to run MS-DOS commands while running vi. Some UNIX shell programs come with their own vi programs as well.

UNIX UTILITIES FOR PROGRAMMING

You may want more than just the look of UNIX. The next most

Many people who think they want to run UNIX can, in fact, run other programs that mimic UNIX and save a huge amount of money, time, and aggravation. If you're thinking about installing UNIX on your PC, you should seriously consider the alternatives first.

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common desire is to have the utilities that people associate with UNIX programming. Some of these are included in some of the shell packages, but many are sold separately.

For example, you may want to use the UNIX "awk" program in your programming on your PC. A few different companies sell awk programs, many of which offer improvements over the ones that come in UNIX. Similarly, you may need the UNIX "lex" or "yacc" programs; again, you can get these from a number of sources.

UNIX was the original home of the C programming language. If you're writing C programs, you've probably noticed that many of the facilities in C seem to relate directly to UNIX. Dozens of UNIX tools developed around C, and most of those have been copied over to MS-DOS. One of the most popular programs, LINT, diagnoses your C programs and looks for problems. There are many versions of LINT on MS-DOS, some available as shareware.

One of the most-used programming aids under UNIX is SCCS, a program that helps keep track of source code as you write it. This, combined with the UNIX make program, makes it much easier to create and update programs as they are being developed. Both of these programs appear in many forms on the PC.

THE NEXT BEST THING: A UNIX-LIKE OPERATING SYSTEM

If you really need the features of the UNIX operating system (as compared to the features of the shell or programming utilities), you can still avoid UNIX, and save hundreds or thousands of dollars and lots of headaches. Two popular operating systems (QNX and Coherent) resemble UNIX but are smaller, easier to install, and less expensive, yet give you the most important parts of UNIX: multiuser and multitasking capabilities, and easy program development. Tens of thousands of people already use each system and have for many years, so you won't be on the "bleeding edge."

QNX, marketed by Canada-based Quantum Software Systems, harks back to the earliest days of UNIX, when the idea was a small, tight operating system that could be extended as needed. QNX's strongest feature is that you can use it for real-time programs, that is, programs that have tight timing constraints. It works well with networks, so you can hook a PC running QNX to other PCs.

Since QNX's kernel (the central part of the operating system) is so small, it runs well even on small systems. Many QNX users claim that it runs just fine on old AT clones. This makes it particularly suitable to systems that control manufacturing tasks, since you can put together a reasonable QNX system for under $1200, including all the hardware. QNX sells for $500 for a single CPU, regardless of the number of users you have on the CPU.

Quantum recently released another version of QNX, v4, that will appeal to a different market. QNX 4 is fully POSIX compatible, meaning that if you program to that international standard, you can port your programs to QNX 4 with almost no effort. QNX 4 is still real-time, and the operating system can be distributed over a network invisibly so that the entire network appears as a single computer. In a large company, this can offer significant administration benefits over tying together different forms of UNIX on different machines. QNX 4 sells for $800 for the first CPU (again, regardless of the number of users) and $700 for each additional CPU.

Mark Williams Company has been making UNIX workalikes for over a decade, and its Coherent product is by far the most popular. Coherent costs only $100, comes on just four diskettes, and installs in a few minutes. Like QNX, Coherent is very compact and thus runs very fast. It also fits nicely into a 10MB partition on your hard disk.

Although Coherent is not an exact UNIX clone, it's hard to tell the difference. It is fully multiuser and multitasking; the Coherent kernel is compatible enough to run most UNIX programs successfully. It

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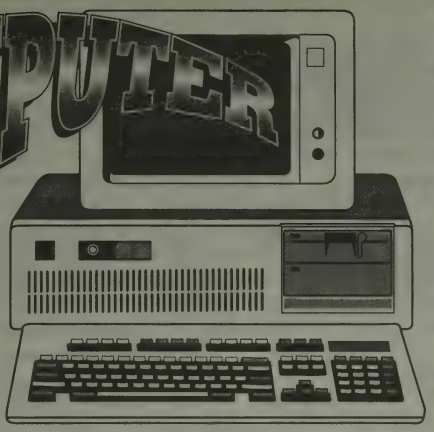

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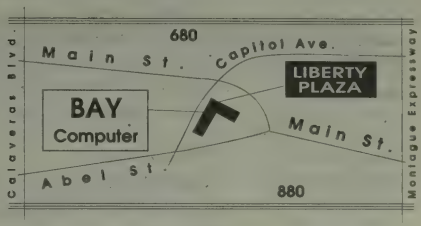

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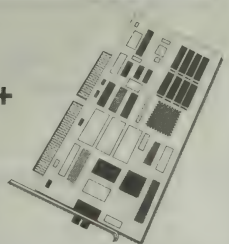

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comes with many of the programming features of UNIX, like lex and yacc, as well as a very good C compiler.

Coherent is an ideal alternative to real UNIX if you were planning to buy UNIX in order to set up a UNIX bulletin board. It comes with the UNIX UUCP program and its own bulletin board software, so you can quickly set up your own truly multiuser bulletin board and still use the system for other work. And, if Coherent doesn't do what you want it to do, you can get a full refund any time in the first sixty days.

TAKING THE LOW ROAD

You may not need to buy anything for your PC if other people in your office are already running UNIX. Since UNIX is a multiuser operating system, you may want to turn your PC into a smart terminal on someone else's UNIX system instead of making your PC a UNIX PC. If you already have a communications program, this can be done for free.

There are many advantages of making your PC just a terminal, particularly if you don't intend to use UNIX much. You don't have to load any software, you don't need to take up disk space with megabytes of UNIX utilities that you will never use, and so on. Being a UNIX terminal may be sufficient for over half of the potential UNIX users who have PCs.

The main disadvantage of being just a UNIX terminal is the ease of transferring files between your PC and the UNIX system. If your communications program allows you to capture incoming text and send text files, you can transfer files fairly easily using the UNIX cat command. If you need to transfer binary files, it can be more difficult but not impossible. Many UNIX systems have commands that allow them to send and receive binary files using the XMODEM protocol or protocols derived from it. Since almost every communication program on the PC can at least send and receive using XMODEM, this will probably work well enough.

There are also many commercial packages that make using networked PCs as UNIX terminals easy. They take care of all of the communications parameters and make binary file transfer invisible. These packages often make it seem like the files on the UNIX system are part of your hard disk and vice versa. Although these programs are not free, they can be very valuable in a company with a mixed MS-DOS and UNIX environment.

DON'T TAKE UNIX LIGHTLY

Regardless of the advertising claims, running UNIX on PCs is rarely easy. Installation can be a phenomenal headache, maintenance is much harder than with standard MS-DOS utilities like the Norton Utilities or PCTools. It is almost always more intimidating to use UNIX than MS-DOS, even for wizards. Most UNIXes that run on the PC say that you can run MS-DOS programs from within UNIX, but they don't always work quite the way you would want.

Given the number of packages that look like parts of UNIX, it is likely that most people who have needs not fulfilled by standard MS-DOS can avoid UNIX fairly successfully. If you need a multiuser/multitasking operating system, you can use a UNIX clone and avoid a great deal of UNIX's unnecessary overhead. And, if you must use UNIX, you might not have to do it on your own PC. ■

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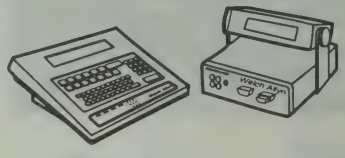

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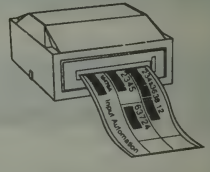

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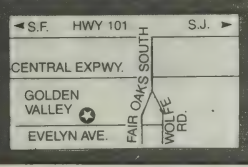

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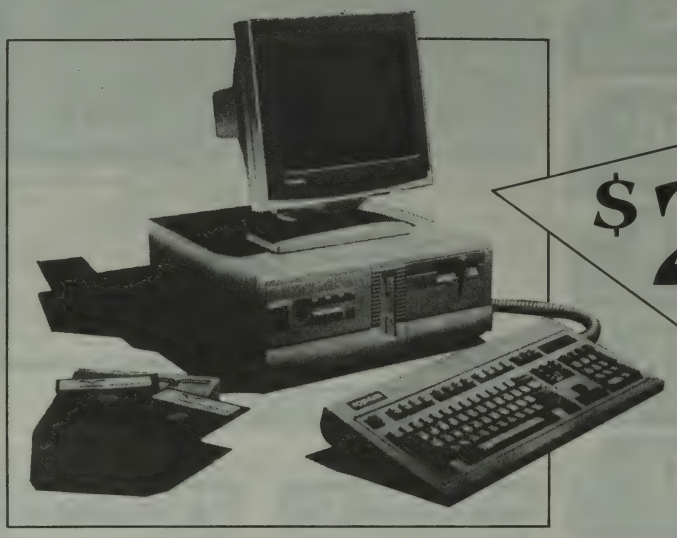

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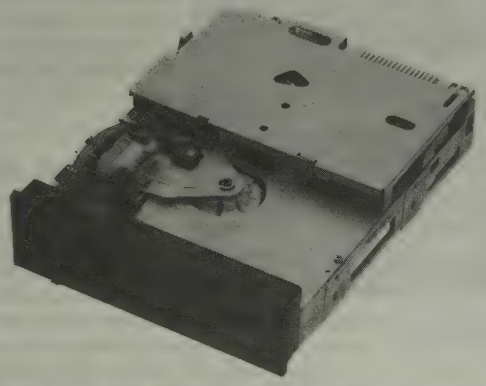

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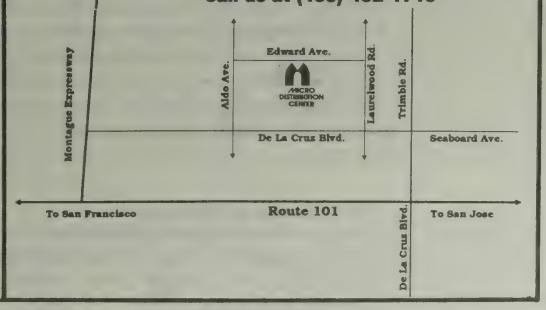

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Your First Computer

About Printers

BY MIKE MARKOWITZ

In the 1460s Johan Gutenberg made it possible for anyone to be a reader. In the 1960s Xerox made it possible for anyone to be a publisher. Personal computers, in the 1990s make it possible for anyone to be a publisher of stuff that looks good and is spelled correctly.

A personal computer printer can cost less than $200 or more than $4000. This twenty-fold price difference covers increasing levels of speed, sharpness, and convenience.

Engineers measure printer speed in characters per second, or pages per minute. The sharpness or resolution of a printer is measured in dots per inch. The convenience of a printer cannot be measured—it is a subjective judgment based on ease of paper loading, flexibility of paper handling, and the mechanics of changing a ribbon or cartridge.

Dot Matrix, Ink-Jet, And Laser Printers—Which One's For You?

Reliability, noise levels, and many other factors may also influence the choice of a printer.

INTERFACES AND DRIVERS

Most printers for IBM PC compatibles use a "parallel" connection. Parallel cables have a 25-pin connector at the computer end, and a flat connector at the printer end. According to folklore, parallel cables should not be longer than about 10 or 12 feet, to avoid transmission errors. The computer's operating system usually calls the parallel port "LPT1."

Most Macintosh printers use a "serial" connection. This is generally somewhat slower, but reliable over longer distances.

To print, all computers need software that translates your text or pictures into commands that the printer understands. These programs are called printer drivers.

On the Macintosh, printer drivers are found in the System Folder. Apple provides drivers for its printers with the system software. Non-Apple printers usually come with their own drivers on a disk.

On PC compatibles, each program has its own printer drivers, unless they simply rely on the generic plain-text driver that is built into DOS. Since there are hundreds of different printer models used by PC owners, these drivers can take up a considerable amount of disk space. You should only install the drivers for printers you expect to use at home, at work, or with colleagues.

DOT MATRIX PRINTERS

The Japanese invented the dot matrix printer, and perfected it to cope with the complexities of their writing system. The world market is dominated by a few Japanese brands including Epson, Toshiba, Panasonic, and Okidata.

Dot matrix printers are classified by the number of "pins" or elements in the print head. Low-cost printers have eight or nine pins, and the individual dots are usually recognizable, giving the output a computer-generated look.

Higher-priced "Near Letter Quality" ("NLQ") printers have twenty-four or twenty-seven pins, and the individual dots merge to form surprisingly sharp letters. There is a tradeoff between speed and sharpness; most printers offer a "draft mode" for high-speed, ugly-but-legible output.

In selecting a dot matrix printer, consider the cost of the ribbon cartridge and the chances that it will continue to be easily available for years to come. It can be frustrating to have to mail-order costly ribbon cartridges for some exotic model that is no longer supported. If a printer is popular, and uses a standard type of ribbon, you should have no worries on this score.

Most current models combine "friction feed" for single sheets and "tractor feed" for continuous computer paper. Many brands offer ingenious (and expensive) envelope feeders that sometimes work. Generally speaking, envelopes and printers have irreconcilable differences that can only be remedied by using adhesive labels. Specialized dot matrix printers include wide-carriage monsters (15" or more) and units that can take plug-in font cartridges.

INK-JET PRINTERS

The ink-jet printer was invented by Hewlett-Packard, and Canon has developed its own version of the technology. Apple's new StyleWriter uses a Canon engine.

The most striking thing about an ink-jet printer is its silence. This alone makes it a good choice in environments where the clatter of a dot matrix printer would be irritating or unacceptable (libraries, for example, often use the old HP ThinkJet).

Considering that the appearance of your documents represents you to your readers, the best printer you can afford is a good long-term investment. Nobody ever regretted looking good in print.

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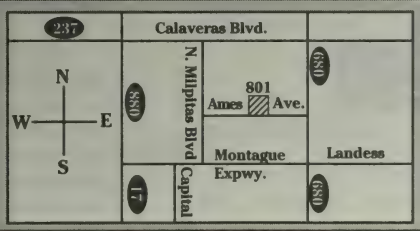

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The output from a dot matrix printer gradually deteriorates as ink on the ribbon wears out, but with an ink-jet printer, the last dot is just as dark and solid as the first. You need to keep spare ink-jet cartridges on hand, since there is little warning when the ink runs out.

First-generation ink-jet printers needed special coated paper for best results, and the ink tended to bleed severely if the paper got even slightly wet. The latest improved inks seem to be solving this problem.

Ink-jet printers are significantly slower than laser printers, but also significantly cheaper, with nearly equivalent output quality.

LASER PRINTERS AND THEIR COUSINS

The back end of a laser printer is similar to a photocopy machine, since it uses a rotating, electrically charged drum to pick up powdery "toner" that is transferred onto paper and fused by hot rollers. The photocopy machine optically scans an original image to determine which spots on the drum get charged up. The laser printer takes a stream of data from your computer, processes it, and uses the information to selectively direct a laser beam to charge the spots on the drum. A few vendors sell printers based a competing technology based on an array of LEDs rather than a laser and a rotating mirror.

The perfection of the electronic and mechanical components is such that a resolution of 300 dots per inch is considered ordinary, and 400 or 600 is becoming increasingly affordable. For comparison, a good video monitor displays 75 dots per inch, and the phototypesetting machines used to produce glossy magazines deliver 1200, 2400, or more.

Laser printers use a replaceable cartridge that contains the toner, the drum, and various other components that can eventually wear out. Typically, a cartridge is good for about five thousand pages. The cartridges are made by Canon, Ricoh, and a few other companies. Some printer models separate the toner cartridge and the drum into separate modules that are replaced at different intervals. Refilling toner cartridges has become a useful little industry, saving users money and keeping thousands of discarded units out of landfills.

ABOUT POSTSCRIPT

PostScript is a "page description language" created by Adobe Systems and licensed to many printer vendors including Apple. A page description language reduces everything on your page to a very compact code of instructions and geometric descriptions. This code can be transmitted quickly from the computer to any PostScript printer.

A PostScript printer contains its own computer, with massive amounts of permanent memory that store precise mathematical descriptions of the characters in various "fonts" or typefaces.

PostScript adds about $500–$1000 to the cost of a laser printer. For desktop publishers who insist on the best, the difference is worth it.

DIGRESSION ON FONTS

Back in the old days, "printer" meant a person who ran a press. Printers used the term "font" to describe a big wooden case divided into dozens of little compartments, filled with pieces of metal type. The term was not derived from any imagined similarity to a baptismal font, but from the Latin word *funditus*, which means "pouring, molding, or casting."

Each font contained all the letters for a particular size and style of a particular design, like 10-point Times Roman or 24-point Bodoni Bold. When computer people gained the ability to print in different typefaces, they started using the venerable term "font" incorrectly to describe all the sizes and styles of a particular typeface. The usage has stuck, to the continuing dismay of printers (the people, not the machines).

IN CONCLUSION

Printers seem to last a long time. Designed for heavy-duty office work, most of the printers attached to home computers are laughably underutilized and will still be going strong when their human and electronic hosts are hoplessly obsolete. Considering that the appearance of your documents represents *you* to your readers, the best printer you can afford is a good long-term investment. Nobody ever regretted looking good in print. ■

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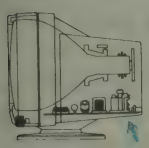

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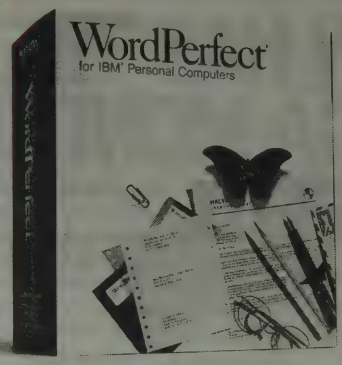

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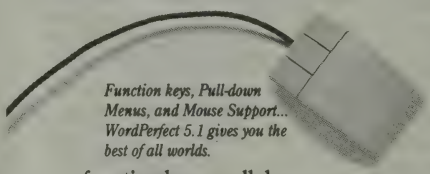

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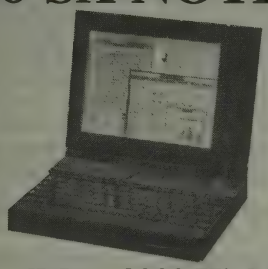
NOTEBOOK COMPUTERS
"Power And Portability Together At Last!"

TravelMate 3000
386-SX NOTEBOOK



TravelMate 3000 Highlights

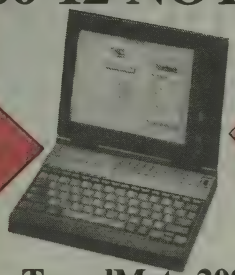
High performance processor
► 80386SX running at 20MHz
Sleek design
► 8.5″(D) x 11″(W) x 1.8″(H)
Lightweight
► 5.7 pounds (including battery)
Large, crisp display
► 640 x 480 VGA black-on-white triple-supertwist, sidelit LCD
Memory
► 2MB RAM expandable to 6MB
Mass storage
► 20MB or 40MB hard disk drive
► Integrated 1.44MB, 3.5″ floppy diskette drive
Standard software
► MS-DOS 4.01, Battery Watch, LapLink, Laptop Manager and software utilities

Options
- 2MB RAM module(s)
- 2400 bps, V.22 bis Hayes® compatible modem with send fax capability and MNP® Class 5 error-checking protocol
- Numeric keypad
- 80387SX-20MHz coprocessor
- Spare internal battery
- Deluxe carrying case

INCLUDES: DOS 4.01, LAPLINK LAPTOP MANAGER AND MORE!

CALL FOR LATEST PRICES AND MORE INFORMATION

TravelMate 2000
286-12 NOTEBOOK



$300 END-USER REBATE ON TM-2000 ENDS AUG. 31, 1991

TravelMate 2000 Highlights

Sleek design
► 8.5″(D) x 11″(W) x 1.4″(H)
Lightweight
► 4.4 pounds (including battery)
High Technology Display
► 640 x 480 VGA Black-on-White triple-supertwist, sidelit LCD
Mass storage
► 20MB hard disk drive
► Removable 1.44MB, 3.5″ floppy diskette drive (optional)
Software
► MS-DOS 4.01 and LapLink loaded in ROM
► Battery Watch, Disk Cache utility, Laptop/File Manager, and more!
Enhanced Keyboard
► Full function AT compatible keyboard
► 79-key layout

Options
- 1MB RAM module(s)
- 2400 bps, V.22 bis Hayes® compatible modem with send fax capability and MNP® Class 5 error-checking protocol*
- CRT monitor interface*
- Removable 1.44MB, 3.5-inch floppy diskette drive
- Numeric keypad
- Add-on battery pack (adds approximately 3 additional hours)
- Expansion station—IBM PC/XT/AT® compatible (1 x full, 1 x half)
- 80C287 coprocessor
- Spare internal battery
- Deluxe carrying case

Keep It Simple Computer Center
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MILPITAS, CA 95035

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(on approved credit) *90 days same as cash

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MADE IN USA
256K Cache & 1MB RAM

FREE MS-WINDOWS 3.0! (w/ System Purchase)

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• 80486 processor, 33MHz • 1MB RAM expandable to 16MB• 256K Cache • 5.25", 1.2MB FDD • IDE-Hard/Floppy controller• 101 enhanced keyboard • Serial/Parallel ports • AWARD BIOS • INTEL chip sets • 1-year warranty

maxell Super Diskette Special!

FREE
Teakwood Disk Box w/ Purchase of 5 boxes HD Formatted Disks!

1.2MB DS/HD Formatted	5.1/4"	$11.99
1.44MB DS/HD Formatted	3.1/2"	16.99
1.2MB DS/HD	5.1/4"	10.99
1.44MB DS/HD	3.1/2"	14.99
360K DS/DD	5.1/4"	6.99
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ACCESS 386-33MHz
OUR MOST POPULAR SYSTEM!
64K Cache & 4MB RAM

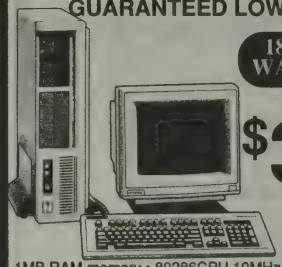
MADE IN USA

FREE MS-WINDOWS 3.0! (w/ System Purchase)

$999

• 4MB memory • 1.2, 5.25" FDD • 1-1 interleave controller • 64k Cache • 101 key keyboard

HYUNDAI Super 286-10MHz
GUARANTEED LOWEST PRICE!

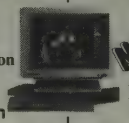


18-MONTH WARRANTY!

$399

1MB RAM memory • 80286CPU,10MHz • MS-DOS 3.2, GW-BASIC • 12 Expansion Slots • 240 watt power supply • 101 key keyboard • 1.2MB, 5.25" FDD • 18-month warranty

NANAO 9500
20" High Resolution
• 1280x1024
• .31mm dot pitch



$1999

NEC LOW RADIATION MONITOR
NEW! 3DS
• 1024x768 resolution
• .28 dot pitch
• 14" Low Radiation
• Built-in tilt/swivel base

$599
4DS 16" NEW! CALL!

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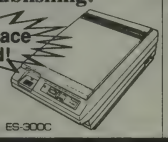
WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY.™ COLOR Scanner
Great for Desktop Publishing!



DOS interface included!

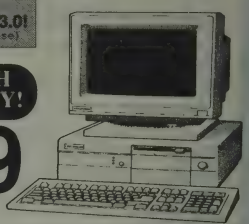
$1499

• 50-600 adjusted resolution
• 16 million colors, 256 level of grey
• MAC interface available

ES-300C

HYUNDAI SUPER 386SX-16MHz
GUARANTEED LOWEST PRICE!

FREE MS-WINDOWS 3.0! (w/ System Purchase)



18-MONTH WARRANTY!

$599

• 80386SX-16MHz • "0" wait state • 1MB RAM exp to 8MB • 5.25", 1.2MB FDD • MS-DOS 4.01• Serial & parallel ports • 6 expansion slots • 101 key keyboard • 18-month warranty

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LOWEST PRICES IN TOWN!
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(*MERCHANDISE MUST BE IN STOCK)

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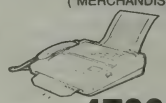
Teakwood Fax Stand Only $26.99



4700
• 10 sheet automatic feeder
• 164' paper capacity
• 256K memory
• 16 grey scale
• Built-in telephone

$699

TOSHIBA TF251	$789
TOSHIBA 4400	$499
TOSHIBA4600	$629
OKIFAX 700	699
SAMSUNG FX1100 GREAT PRICE!	399
SAMSUNG FX 2310	529

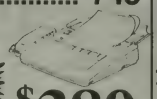
SHARP FO-216

$589

• Auto cutter
• Auto fax/phone switch
• Answering machine hook-up

SHARP FO-120	$418
SHARP FO-240	$699
SHARP FO-334	$748

MURATA M1100



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•Automatic Paper Cutter
•Advanced calling features
•Automatic multi-page feeder
•Secondary phone connection

MURATA M900 ..... $299

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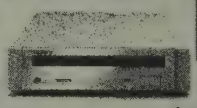

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*FREE TEAKWOOD CD HOLDER! Holds 18 CDs w/ Purchase of System!

• 640MB Storage
• Large Software Collection
• 6 Educational Software Packages
• 1 year limited warranty

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NEW! LITTLE BIG DRIVE Super Baby™

Great for Notebooks & Laptops
• Small, Light & Portable
• Low Profile 1 1/4" High
• Weights Only 2 lbs

External Hard Disk Drive
Powered from floppy drive port!

40MB	25ms	$599
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PRICE SUBJECT TO CHANGE W/OUT NOTICE

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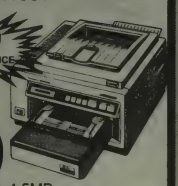
SAVE $150 OFF ORIGINAL SALE PRICE



$699

- 512K RAM exp to 4.5MB
- 250 sheet paper capacity
- 300 dpi resolution • 8 PPM
- 90-day warranty

10-20 % BELOW DEALERS COST!

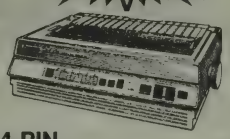
THOUSANDS OF PRODUCTS IN STOCK!

•ALL PRODUCTS ARE FACTORY RECONDITIONED & FULLY GUARANTEED

Panasonic Office Automation

KX-P1124

SAVE $50 OFF ORIGINAL SALE PRICE



24-PIN

- 192cps, 63cps LQ
- 5 built-in LQ fonts
- 2 year warranty

$199

Panasonic Office Automation

KX-P1695

SAVE $70 OFF ORIGINAL SALE PRICE

- High speed printing
- 375 characters per second
- Super letter quality

$299

Panasonic Office Automation

KX-P1191

SAVE $90 OFF ORIGINAL SALE PRICE

$149

- 240cps, 48cps NLQ
- 4 built-in NLQ fonts
- 2 year warranty

KX-P2150

Same as KX-P1180

- 192cps, 38cps NLQ
- 4 built-in NLQ fonts
- 2 year warranty

$119

Panasonic Office Automation

KX-P1624

24-PIN

SAVE $50 OFF ORIGINAL SALE PRICE

- 192cps, 63cps LQ
- 5 built-in LQ fonts
- 2 year warranty

$299

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SUPER VGA MONITOR .28 DOT PITCH INTERLACED

C1381

SAVE $50 OFF ORIGINAL SALE PRICE

MAC & IBM COMPATIBLE

- Super VGA Monitor
- .28mm dot pitch
- 1024x768 resolution

$299

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WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY.™

LQ-850

SAVE $160

$299

- 264 cps
- Push tractor feed
- 1 year warranty

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SAVE $100

- 264 cps
- 240x216 dpi res
- 1 year warranty

$229

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SAVE $200 OFF ORIGINAL SALE PRICE

EPL-6000

LASER

$555

- 300X300dpi resolution • 6 ppm
- 6 resident fonts •512K exp. to 4.5MB
- EPSON's 2 year limited warranty

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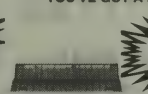

LQ-2550 COLOR

$599

- 400 characters per second
- 360x360 dpi resolution • 24-pin printer• 7 resident fonts • 1 year warranty

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Multi-part & invoice printing!

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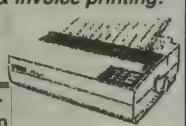

Color Option $50

EX-800 **$249**

- 300cps • 9-pin printer
- 80 column • Brand New printer
- 1 year limited warranty

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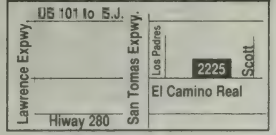

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SAT-SUN 10 - 5

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Affordable Leasing Available!

Custom Configurations Available!

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PostScript Laser

$1899

- 2MB RAM exp to 4MB
- 500 sheet paper capacity
- 26 internal fonts • 11PPM

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- 512K RAM exp to 4.5MB
- 250 sheet paper capacity
- 300 dpi resolution • 8 PPM

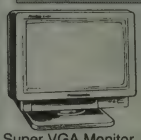
Notebook Size Laptop CF-370

NEW! Weights 7LBS

$2999

- 386SX-20MHz • 3.5", 1.44MB FDD
- **60MB HDD** • Backlit LCD • 1MB exp to 5

SUPER VGA MONITOR .28 DOT PITCH INTERLACED



C1381

MAC & IBM COMPATIBLE

- Super VGA Monitor
- .28mm dot pitch
- 1024x768 resolution

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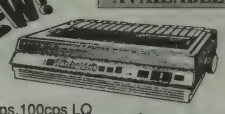
NEW! **C1395 ..Non-Interlaced..$549**

KX-P2624 Silent Printer

THE QUIETEST PRINTER AVAILABLE!

NEW!



- 300cps,100cps LQ
- 24-pin letter quality
- 11 fonts, 26K buffer
- 1 year limited warranty

$448

KX-P1123

- 192cps, 63cps LQ
- 5 built-in LQ fonts
- 2 year warranty

$238

KX-P1180 .....$147

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- 300cps, 80cpsLQ
- 8 built-in LQ fonts
- 2 year warranty

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KX-P1524 132 CL $359

14" Multi-Frequency Color Monitor

C1391

MOST AFFORDABLE VGA MONITOR!

- .31mm dot pitch
- 1024x768 resolution

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- Supertwist backlit LCD screen
- Serial/parallel ports • MS-DOS 3.3

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286-10MHz w/ 40MB HDD *Notebook Size* Laptop

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- 3.5", 1.44MB FDD • MS-DOS 3.3 w/GW-BASIC
- Rechargeable & Removable battery pack

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80386SX-16MHz

LAPTOP COMPUTER WEIGHTS ONLY 13 LBS.!

NEW!

D/LT386SX Plus w/ 40MB HDD & Windows

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- 80386SX, 16 MHz • 2MB RAM • 3.5",1.44 MB FDD/40MB HDD • PS/2 compatible mouse port
- Windows, MS-DOS/GW BASIC included

TEXAS INSTRUMENTS

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*$1550 WEIGHTS ONLY 4.4lbs.

(* Includes $300 mfg. rebate)

- 80C286, 12 MHz w/ 20MB HDD
- 1MB RAM exp. to 3MB
- VGA resolution 640x480
- MS-DOS 4.01 & Laplink included

TRAVELMATE 3000 NOTEBOOK COMPUTER

386SX 20MHz 40MB HDD 2MB RAM $2999

- 80386SX, 20 MHz w/ 40MB HDD
- 2MB RAM exp. to 6MB
- VGA resolution 640x480
- MS-DOS 4.01 & Laplink included

60MB HDD Version....$3299

ACCESS made computing affordable!

LEADING EDGE

80386SX-16MHz

NOTEBOOK-SIZE WEIGHTS ONLY 6.9 LBS.!

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$1999

- 80386SX, 16 MHz • 1MB RAM exp. to 5MB
- 3.5",1.44 MB FDD/20MB HDD •VGA resolution
- MS-DOS/GW BASIC included

ARC 3000

Notebook Size Laptop 386SX-16MHZ w/40MB HDD

WEIGHTS ONLY 6.8 lbs!

NEW!

$1899

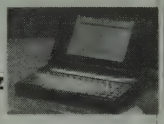
- 1MB RAM expandable to 5MB • 40MB IDE HDD • 3.5", 1.44MB FDD • VGA LCD display • 80 key keyboard w/ 12 F keys • Parallel & serial, VGA monitor & keyboard ports • 6.8lbs

TEMPO LX EVEREX

NoteBook Size Laptops

386SX-16MHz w/20MB HDD $2199

- Backlit VGA display
- 1MB exp to 5MB
- 3.5" FDD • MS-DOS 4.01
- Weights 7lbs w/battery



386SX-20MHz w/60MB HDD

- Backlit VGA display
- 1MB exp to 5MB
- 3.5" FDD • MS-DOS 4.01
- intel 80387SX coprocessor support
- Weights 7lbs w/battery

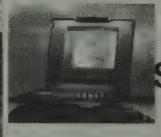
$2899

2MB Memory $299

ULTRA thin

NEW! *Notebook Size Laptop*

ONLY 1 1/4" THIN! ONLY 4.4 LBS!



$2495 IN STOCK!

- 80386SX, 20MHz • 30MB HDD•External 3.5",1.44MB FDD
- Backlit VGA display
- Full-travel keyboard w/ 10 F keys
- Parallel & serial ports

40MB HDD Model **60MB HDD Model** ***Call For Prices!***

Price & Availability subject to change w/out notice

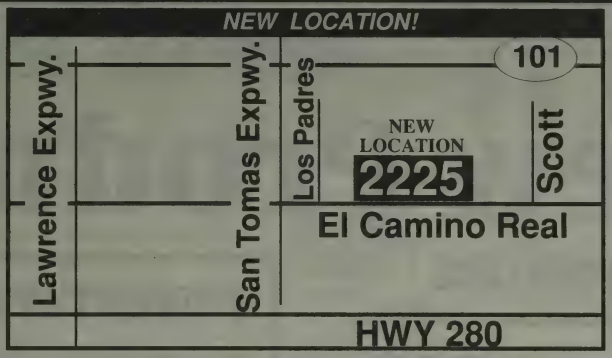
ACCESS is now BIGGER & BETTER

SEE OUR LARGE NEW SHOWROOM!

NEW
EXTENDED HOURS
MON-FRI 9 - 8
SAT-SUN 10 - 5

Affordable Leasing Available!

NEW LOCATION!



Custom Configurations Available!

SALES
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SERVICE
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Maxtor
- 7040 42MB 28ms 3.5" IDE $209
- 7080 80MB 19ms IDE $299
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- LXT-213 200MB 15ms IDE $599

Seagate
- ST157A 40MB 28ms IDE $189
- ST-251-1 40MB 28ms MFM $229
- ST-1102A 89MB 19ms IDE $299
- ST-1239A 211MB 15ms IDE $649

TOSHIBA
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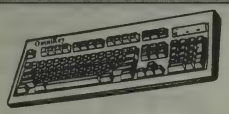
NORTHGATE COMPUTER SYSTEMS

•EXCLUSIVE AUTHORIZED KEYBOARD DEALER



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NON-INTERLACED

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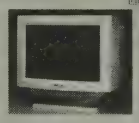

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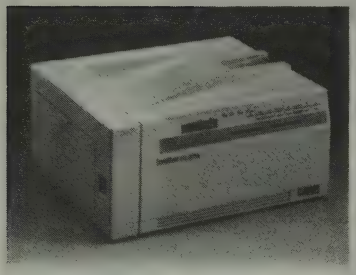
PRODUCT SPOTLIGHT

New Products

PRINTERS

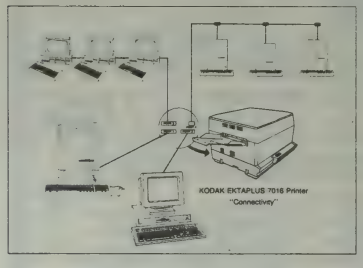
BROTHER LOW-COST POSTSCRIPT LASER PRINTER

The HL-4PS PostScript-compatible laser printer offers the same superb graphics as the award winning Brother HL-8PS. The HL-4PS's thirty-five standard fonts and 300dpi resolution contain 2MB of RAM, upgradable to 6MB, and a 32-bit, 40MHz TI TMS 34010 graphics processor. The standard multipurpose paper tray holds fifty sheets of paper, while an optional lower tray has the capacity for 250 sheets. To optimize use with today's office applications, the HL-4PS offers both BR Script, a Brother-developed PostScript Language interpreter, and HP LaserJet Series II emulation. ($2595) Brother International Corp., 200 Cottontail Lane, Somerset, NJ 08875-6714. (908)981-0330.



KODAK PRINTER FOR WORKGROUPS

The Kodak Ektaplus 7016 printer can function as a sophisticated printer on its own, or accept jobs from print servers or networks. The printer can be connected in any combination of serial, parallel, or AppleTalk configurations using up to four ports. Five emulations are available for each port: HP LaserJet II, HP 747A plotter, Diablo 630, IBM Proprinter, Epson FX80 emulations, and AppleTalk, which requires the purchase of an optional Adobe PostScript board. Most features can be adjusted at the printer through an operator control panel and 40-character LCD display. ($5495, the Adobe PostScript board is available for $1995). Eastman Kodak Co., 901 Elmgrove Rd., Rochester, NY 14653-6305.



STAR MICRONICS LASERPRINTER 4 STARSCRIPT

LaserPrinter 4 StarScript is the newest low-cost, PostScript-compatible printer from Star Micronics. Built

Continued on page 133

PRODUCT UPDATES

➤**Adobe Systems** has announced that **Adobe Photoshop 2.0 for the Macintosh** is now available. Registered owners can upgrade for $199. Adobe Systems, Inc., 1585 Charleston Rd., PO Box 7900, Mountain View, CA 94039-7900. (415)961-4400.

➤**Fifth Generation Systems** released **Fastback Plus v3.0**. Upgrades are available for $49. Fifth Generation Systems, Inc., PO Box 83260, Baton Rouge, LA 70884-0359. 1-800-873-4384.

➤**International Microcomputer Software** has announced **TurboCAD v1.8**, with up to five times the speed of earlier versions and superior storage to let users draw at any size. International Microcomputer Software, Inc., 1938 Fourth St., San Rafael, CA 94901. 1-800-833-4674 or (415)454-7101.

➤**Manzanita Software** has introduced **BusinessWorks Integrated Accounting Systems v7.11**. Major enhancements include a menu utility that allows other applications to be integrated within the BusinessWorks menu structure, and a ZIP code editor. A trial copy is available for $19.95. Manzanita Software System, Inc., 1-800-447-5700.

➤**Paracomp** announced an in-line upgrade of **FilmMaker**, its animation software. This free upgrade adds functionality and corrects several problems associated primarily with the Animate module. Paracomp, Inc., 1725 Montgomery St., 2nd Floor, San Francisco, CA 94111.(415)956-4091.

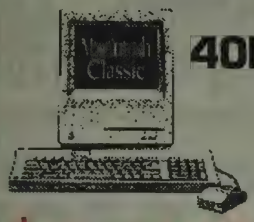
➤**PC DOCS v4.0** provides a broader range of features and capabilities, particularly in the way system managers can define the document management process in a multiapplication environment. **PC DOS, Inc.**, 124 Marriott Dr., Suite 203, Tallahassee, FL 32301. (904)942-3627.

➤**Phar Lap Software** has released **386 | DOS-Extender v4.0**, allowing multimegabyte Extended-DOS applications to run under Windows 3.0 enhanced mode. Current customers can update free from v3.0. Phar Lap Software, Inc., 60 Aberdeen Ave., Cambridge, MA 02138. (617)661-1510.

➤**Sybase** announced the availability of **Sybase SQL Server, Release 4.8**, with support for symmetric multiprocesssor (SMP) systems. Sybase, Inc., 6475 Christie Ave., Emeryville CA 94608. (415)596-3500.

➤**The Complete Writer's Toolkit v1.1** reduces the RAM requirement to 10K for its five pop-up reference tools. Registered owners will receive the update free. **Systems Compatibility Corp.**, 401 N. Wabash, Suite 600, Chicago, IL 60611. (312)329-0700.

MAC @ Fry's ELECTRONICS



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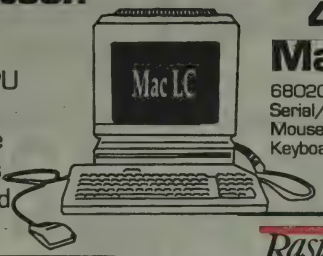

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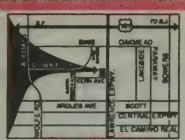

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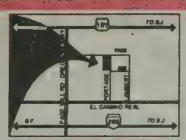

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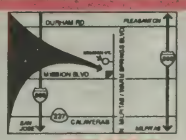

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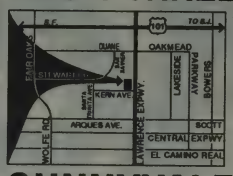

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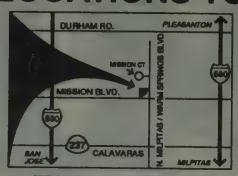

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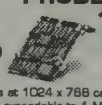

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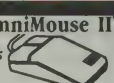

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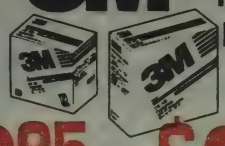

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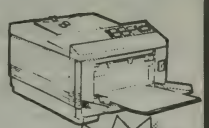

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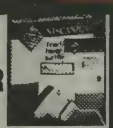

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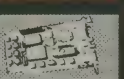

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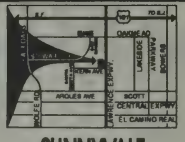

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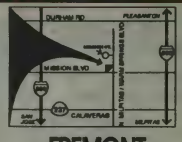

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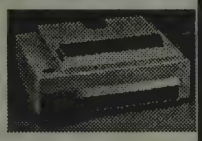

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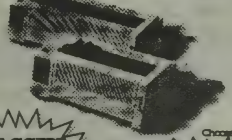

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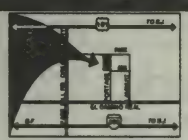

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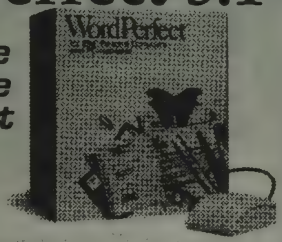

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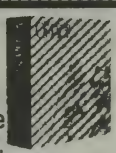

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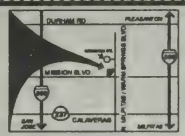

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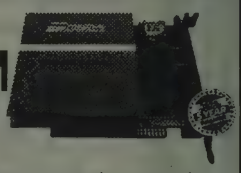

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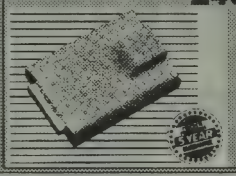

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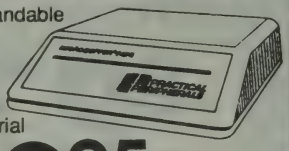

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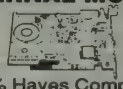

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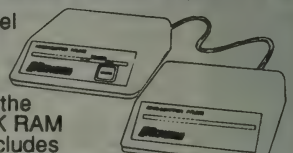

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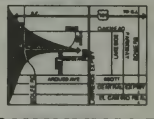

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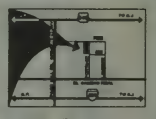

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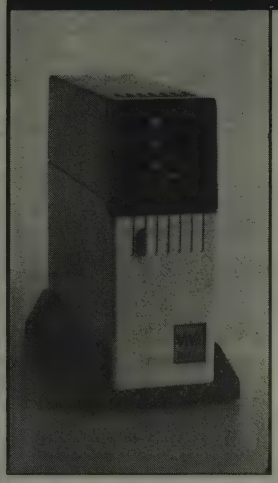

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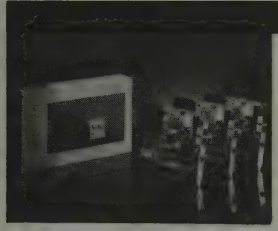

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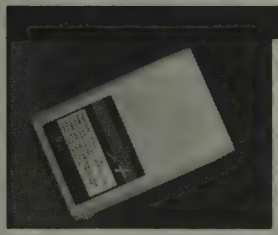

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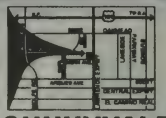

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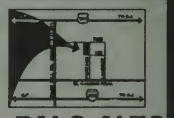

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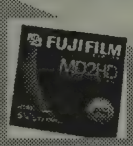

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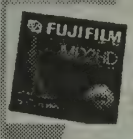

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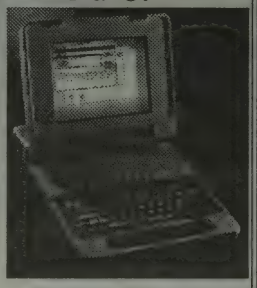

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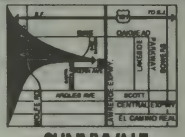

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- Supervised (self-checking) sensors
- Can protect up to 16 doors/windows
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- Wireless passive infrared motion detector (optional)
- Wireless 110 dB remote siren (optional)

FREE! * Through August KR574 Key Chain Remote ($25 value) with purchase of HS9000 system.

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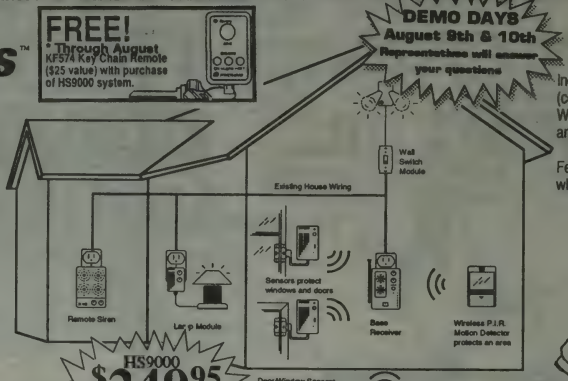

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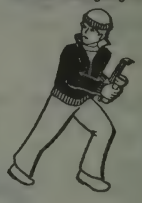

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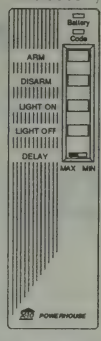
Door/Window Sensors and Remote Controls send wireless signals to Base Receiver

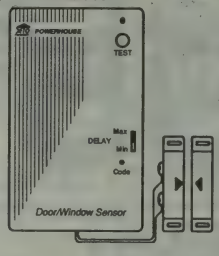
The Remote Control arms and disarms the system and controls lights remotely.

HT544 Included



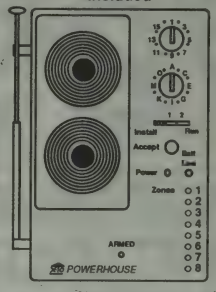
The system is armed and disarmed by the press of a single button — simple! You can also control lights remotely.

DW534 Included



Sensors send wireless signals to the Base Receiver when a door or window is opened. You can protect up to 16 door/windows by adding more sensors. Sensors are supervised for professional reliability - they report in to the Base Receiver every 90 minutes.

BR521 Included



Base Receiver makes a loud noise when alarm is tripped and sends signals over existing house wiring to flash lights connected to X-10 modules.

LM465 Included

A lamp plugged into the Lamp Module will flash on and off when the alarm trips. You can also turn the lamp on and off by remote control.

SP544 Optional

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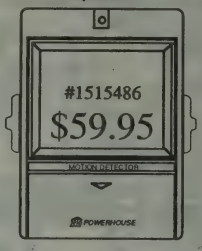
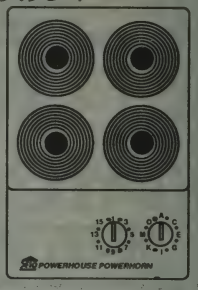


Supervised Wireless Motion Detectors send signals to trip the Base Receiver's alarm when someone walks within range.

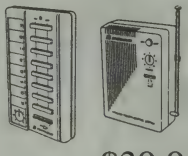
#1515453 $49.95 PH508 Optional



Remote wireless 110 dB siren receives signals over house wiring and trips when Base Receiver's alarm is tripped.

The Protector Plus Supervised Security System can be expanded into a Home Automation System. The items shown below can be used either with the security system or alone to let you turn lights and appliances on and off by remote control. A complete range of controllers is available. The controllers send signals over existing house wiring to control lights and appliances connected to various types of modules. You can time your lights to turn on and off to give your home a lived-in appearance or even turn them on and off from any touch-tone phone. Everything just plugs in. It's just that simple!

Wireless Remote Control
RC5000



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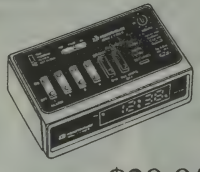
MT522



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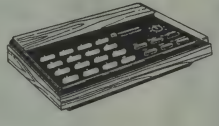
SC503



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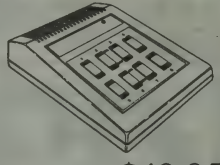

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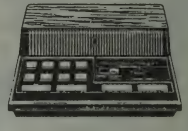

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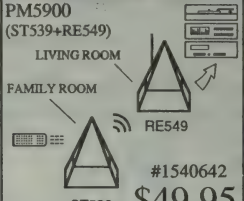
Dusk-to-Dawn Sundowner
SD533

#1481172 $19.95

Powermid Remote Extender
PM5900
(ST539+RE549)



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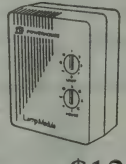
Lamp Module
LM465



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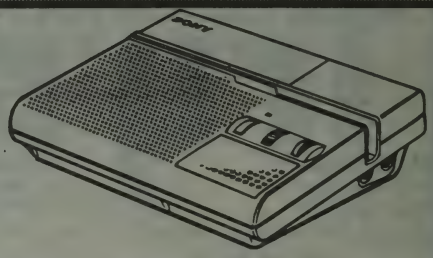

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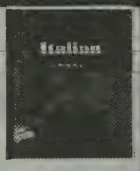

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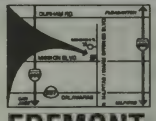

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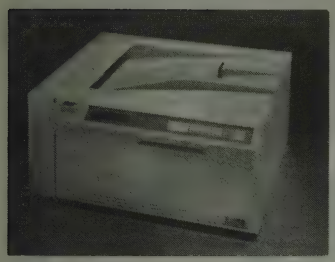
PRODUCT SPOTLIGHT

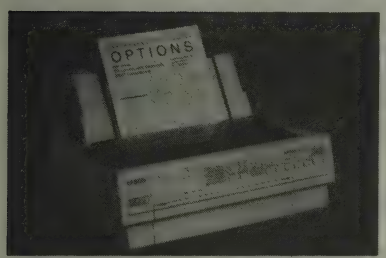
Continued from page 116

around the Intel i960 microprocessor, which allows high-speed throughput of complex graphics, the LaserPrinter 4 StarScript comes standard with 2MB of RAM, thirty-five resident outline fonts from ten typeface families, and fourteen bit-mapped fonts. In addition to providing PostScript emulation, it also includes HP LaserJet IIP and Epson FX-850 as standard emulations. IBM Proprinter emulation is also available as an option. Standard interfaces include RS-232C serial and Centronic parallel interfaces for use with IBM PC and compatibles, and AppleTalk for connecting with Apple Macintosh computers. ($1995) Star Micronics America, Inc., 420 Lexington Ave., Suite 2702, New York, NY 10170. (212)986-6670.



EPSON ENHANCED PRINTERS

Epson has introduced its next generation of letter-quality printers that incorporates scalable fonts, enhanced graphics, a new case design, faster speeds, and improved paper-handling features. The LQ-570 provides 24-pin letter-quality output and ESC/P 2, its new control language. Along with scalable fonts, ESC/P 2 has an enhanced graphics mode that places dots more accurately for sharp, 360 x 360 dpi output. Backward compatibility with the earlier ESC/P standard ensures continued functionality with existing software. The LQ-570 printer comes with an 8K input buffer, a draft font, nine bit-mapped fonts, two scalable fonts, and a print speed of 315cps in draft mode at 15cpi. ($499) Epson America, Inc., 20770 Madrona Ave., Torrance, CA 90509-2842. (213)782-5161.



ALPS PC COLOR PRINTERS

The ALQ224GX narrow carriage printer and ALQ324GX wide carriage printer are rugged 24-pin color dot-matrix printers with increased speed, better paper handling, and a high durability rating. The ALQ printers are designed with a bi-directional tractor feed that allows both push-pull and push-only paper feeds to help eliminate paper jams. They also feature an automatic tear bar that automatically moves the paper perforation to the tear bar once the printer stops. Six resident and two optional fonts can be selected through the printers' easy-to-use front panel, as well as use of the Macro Mode and Memory Mode features. Both ALQGX printers have a top speed of 336 characters per second (cps) in draft mode and 111 cps in letter-quality mode. (Suggested list price is $799 for the ALQ224GX and $999 for the ALQ324GX) ALPS America, Inc., 3553 N. First St., San Jose, CA 95134. (408)432-6000.

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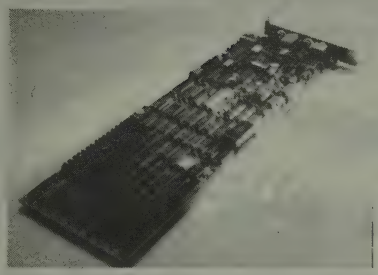
The ProVGA/TV converts VGA graphic signals into high-quality NTAC and high-resolution S-VHS video for display on any color television monitor or for recording to VCRs, camcorders, electronic still photography cameras, and any RS170/NTSC recorder. Because this board obtains the VGA signal from the feature connector on top of the video graphics adapter it is not tied to a specific VGA chip. As a result, users can upgrade their VGA card as new technologies are introduced without the added cost of replacing the VGA-to-video board. The built-in genlock capability permits easy synchronization of incoming video signals with the image on the VGA screen to produce crisp, flicker-free outputs. ($695) Aitech International, Inc., 830 Hillview Ct., Suite 145, Milpitas, CA 95035. (408)946-3291.

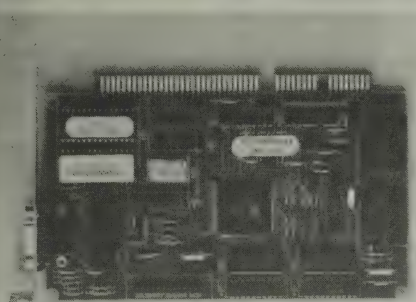


HERCULES GRAPHICS STATION

The Hercules Graphics Station MC is a high-performance graphics board for IBM PS/2 Micro Channel systems, offering 16.7 million color (24-bit) photo-realistic image display and accelerated graphics execution with its 60MHz TI processor. In addition to the TI processor, the Hercules Graphics Station MC features high-performance drivers for Windows 3.0, TIGA 2.0, and Autodesk ADI v4.0/4.1, including 24-bit rendering with 3D Studio and AutoShade 2.0. It comes equipped with 1MB of video RAM and 1MB of DRAM. DRAM can be upgraded to 4 or 8MB. ($1395) Hercules Computer Technology, Inc., 921 Parker St., Berkeley, CA 94710. (415)540-6000.

BELL COMPUTER VGA ADAPTER CARD

The Freedom VGA, a new 1MB VGA adapter card from Bell Computer Systems, is one of the industry's fastest VGA adapter cards. It is tested at 7,175 characters per millisecond on Landmark 2.0 using a 33MHz 386 computer. This performance makes it ideal for applications requiring high-speed video performance, such as AutoCAD, Ventura Publisher, GEM, and Lotus 1-2-3. The card is fully com-



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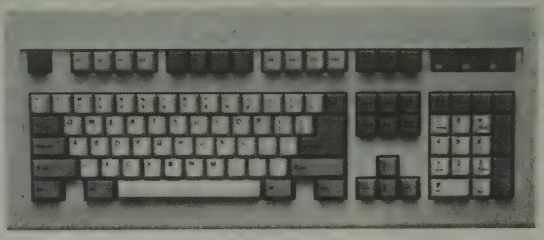

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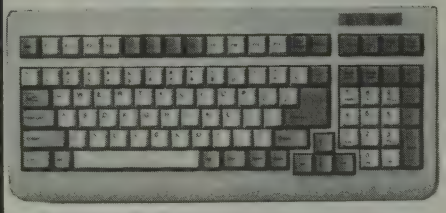

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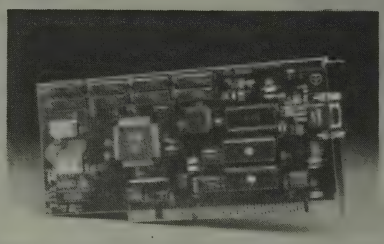
PRODUCT SPOTLIGHT

patible with ISA bus and is available in 512K and 1MB versions. ($249) Bell Computer Systems, Inc., 6615 Valjean Ave., Van Nuys, CA 91406. 1-800-922-1126.

WELLCOM VIVIDVUE HIGH-SPEED GRAPHICS ADAPTERS



The two new VividVue graphics adapters from WellCom offer higher resolution support and more simultaneous colors than standard VGA. The VividVue VGA supports monochrome and up to 256 colors at resolutions through 1024 x 768. The VividVue HiColor lets users see up to 32,768 colors simultaneously in HiColor mode in 640 x 480 or 800 x 600 resolution. Both boards provide automatic detection of 8- or 16-bit slots. VividVue graphics adapters support both monochrome and color high-resolution graphics and text analog monitors, such as IBM PS/2 monitors, NEC MultiSync, and Sony's MultiScan monitors. They are also backwards compatible with EGA, CGA, MGA, and Hercules graphics modes. (VividVue VGA with 512K memory has a suggested retail price of $295, with 1MB is $325. VividVue HiColor is $395) WellCom, Corp., 2085-B Zanker Rd., San Jose, CA 95131. (408)441-6499.

ORCHID PRODESIGNER IIS

The ProDesigner IIs takes VGA graphics to a new level. It offers up to 32,768 true colors in resolutions up to 1024 x 768. In SuperVGA mode with 256 colors it supports flicker-free operation with higher refresh rates to 72Hz.

The ProDesigner IIs is available in two configurations—512K or 1MB—and maintains full VGA compatibility with interlaced and non-interlaced monitors. It also supports display standards such as MDA, Hercules, CGA, and EGA with the optional Orchid Translation ROM. ($349 with 512K RAM, $449 with 1MB RAM) Orchid Technology, Inc., 45365 Northport Loop W., Fremont, CA 94538. (415)683-0300.

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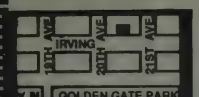

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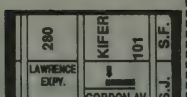

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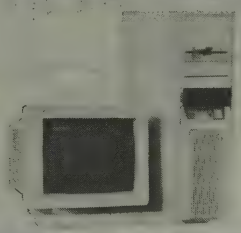

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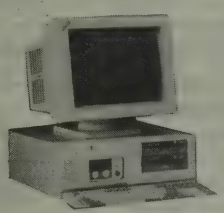

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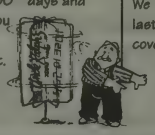

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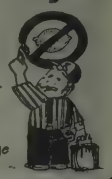

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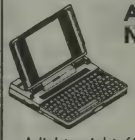

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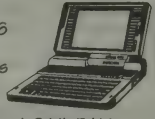

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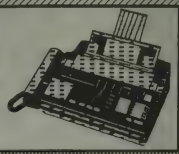

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PRODUCT SPOTLIGHT

LAPTOPS

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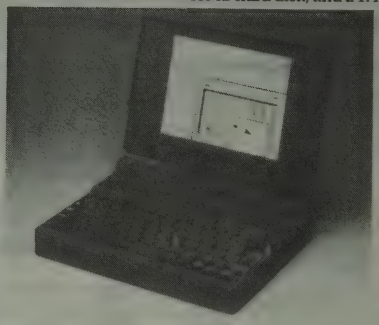

The Altima LSX features a 20MHz 386SX, 1MB of RAM, a 40MB hard disk, and a 1.44MB floppy disk drive. The VGA display features 640 x 480 resolution with thirty-two levels of gray scale, while the CCFT backlit LCD technology provides excellent text and graphics. This notebook computer weighs only 6.3lbs. including the battery. It comes standard with DOS 4.01, AC/DC adapter with power cord, and a carrying case. Options include an internal Hayes-compatible 2400 baud modem with send-fax capability, a second battery pack, and RAM expansion cards. ($2999) Altima Systems, Inc., 1390 Willow Pass Rd., Suite 1050, Concord, CA 94520. (415)356-5600.

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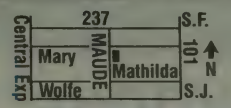

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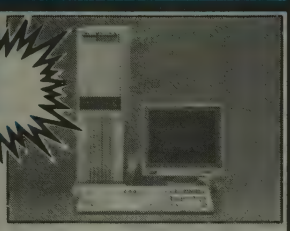

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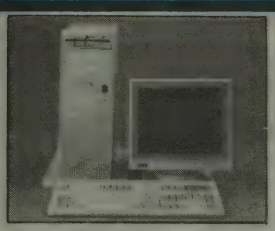

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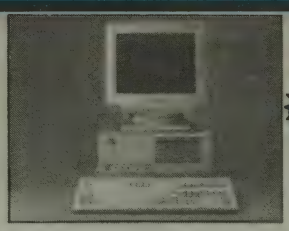

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- 120 MB Hard Drive (15ms)
- 5.25″ (1.2 MB) TEAC floppy drive
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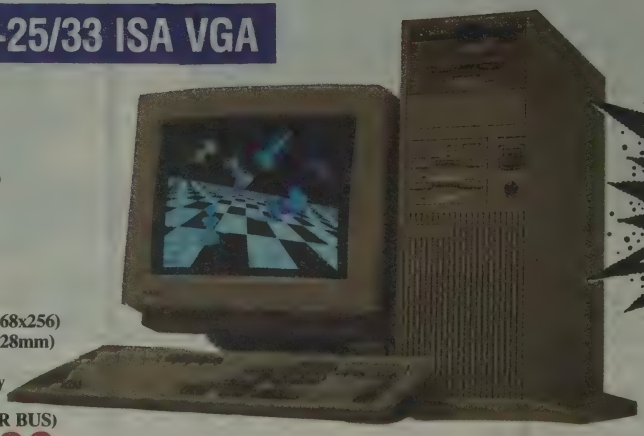

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- IDE Controller
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- MGP Or 16-Bit VGA Card 1024x768 w/512K
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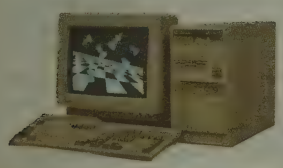

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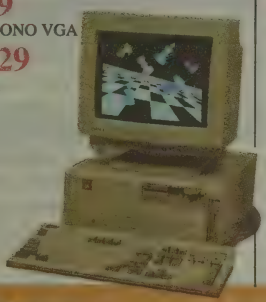
- 40 MB Hard Disk 25ms
- 1.2 MB TEAC Floppy Drive
- 1.44 MB TEAC Floppy Drive
- IDE Controller
- Mono or VGA Monitor 1024x768
- MGP Or 16-Bit VGA Card 1024x768 w/512K
- 2S/1P/1G
- 220W Power Supply
- Baby AT Case or Mini Upright
- 101 Enhanced Keyboard

$829 MONO
$929 14" MONO VGA
$1129 SVGA

90 MB .....+$130
120 MB .....+$205
200 MB .....+$440



286-12 MHz w/40 MB

LANDMARK=15.6 MHz

- 1 MB RAM Exp to 4 MB
- 40 MB Hard Disk 25ms
- 1.2 MB or 1.44 MB TEAC Floppy Drive
- IDE Controller
- Mono or VGA Monitor 1024x768
- MGP or 16-Bit VGA Card 1024x768
- 2S/1P/1G
- 220W Power Supply
- Baby AT Case or Mini Upright
- 101 Key Enhanced Keyboard

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$719 14" MONO VGA
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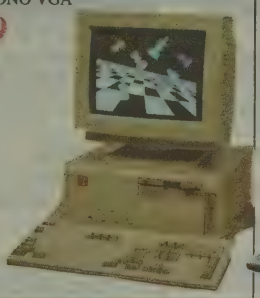
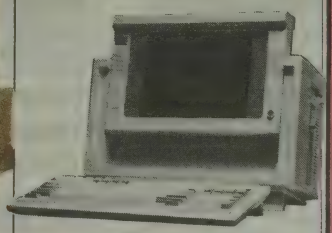


LCD PORTABLE w/40MB VGA

- 640x400 Resolution
- 1 MB RAM
- 1.44 MB TEAC Floppy Drive
- 1.2 MB TEAC Floppy Drive
- 40 MB Hard Disk 25ms
- Hard/Floppy Controller
- 2S/1P Ports
- Ext. Monitor Connector
- 32 Gray Scale
- Carrying Bag Included

386-25 MHz $1599
386-33 MHz w/64K Cache 1749
486-25 MHz w/128K Cache 2249
(640x480 Pixel Graphic Display, 800x600 Pixel Graphics on Ext. VGA or Multisync)



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486/GAS PLASMA VGA plus PORTABLE 200MB

- 25 MHz INTEL CPU
- 128K Cache
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- 256 Color Simulation
- Carrying Bag Included
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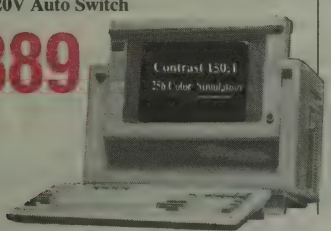

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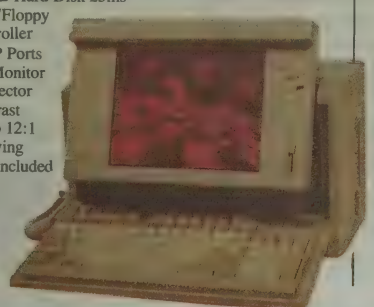
386-33 MHz/64K Cache $1769
486-25 MHz/128K Cache 1919
2419
(640x480 Pixel Graphic Display, 800x600 Pixel Graphic On Ext VGA or Multisync)

- 640x400 Resolution
- 1 MB RAM
- 1.44 MB TEAC Floppy Drive
- 1.2 MB TEAC Floppy Drive
- 40 MB Hard Disk 25ms
- Hard/Floppy Controller
- 2S/1P Ports
- Ext Monitor Connector
- Contrast Ratio 12:1
- Carrying Bag Included



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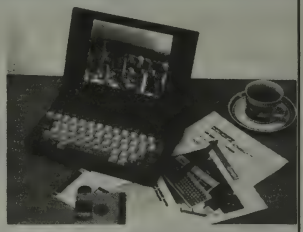

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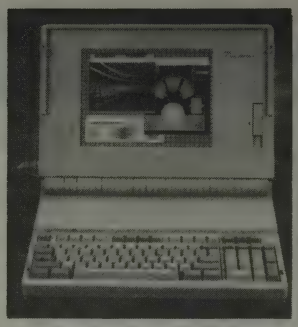
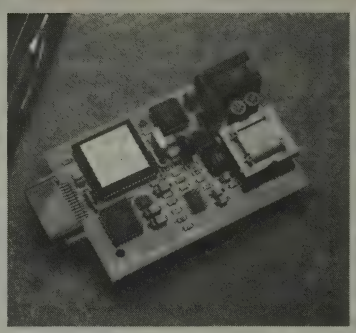


Transistor (TFT) active matrix color screen, a 20MHz 486SX processor, 2MB of RAM expandable to 20MB, and a 32-bit EISA expansion slot. Windows 3.0 and MS-DOS 5.0 are included with a 120MB hard disk drive, a 1.44MB floppy drive, and a 91-key QWERTY AT-compatible keyboard. ($8999) NEC Technologies, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719. (508)264-8000.

TOSHIBA 386SX COLOR PORTABLE DESKTOP

The Toshiba T3200SXC matches a 20MHz 386SX processor with advanced color LCD technology, offering business and technical users the ideal presentation tool: superior full-color display with desktop capabilities in a portable package. Providing high contrast and high-speed screen response, the T3200SXC's active matrix VGA-compatible display uses TFT LCD technology and can display 256 simultaneous colors. This desktop portable has 1MB RAM standard, expandable to 13MB, two internal IBM-compatible expansion slots (one full-size 16-bit and 1 half-size 8-bit), a dedicated Toshiba internal modem slot, 120MB hard disk, 1.44MB floppy drive, and a 91-key full-function standard keyboard. ($8999) Toshiba America Information Systems, Inc., Computer Systems Division, 9740 Irvine Blvd., Irvine, CA 92718. 1-800-344-3445.



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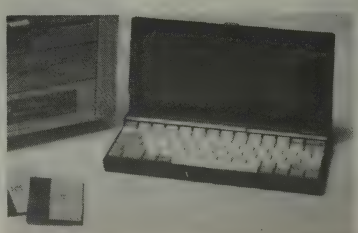
The MaxFax 962LT-C is an integrated fax/modem card for the Compaq LTE and LTE 386s/20. It features a full send and receive 9600 bps Group III-compatible fax and a 2400 bps Hayes-compatible modem. The MaxFax 962LT-C also offers auto direct to determine if an incoming call is for the fax or modem and background operation. Since the 962LT-C has its own on-board microprocessor, its operation doesn't interfere with the computer's microprocessor or degrade system performance. ($599) Macronix, Inc., 1348 Ridder Park Dr., San Jose, CA 95131. (408)453-8088.



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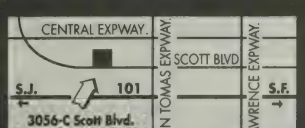

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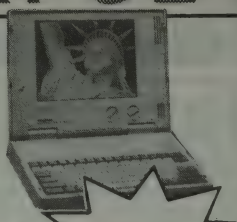

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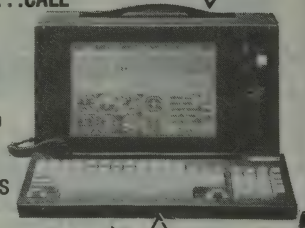

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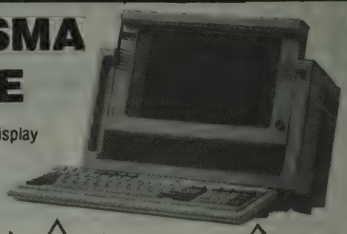

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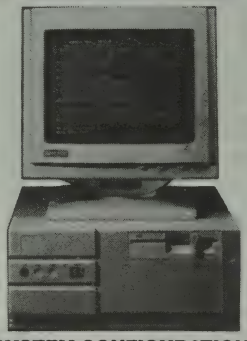

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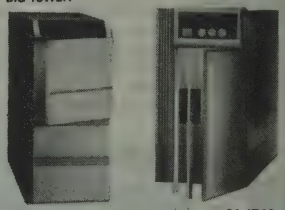

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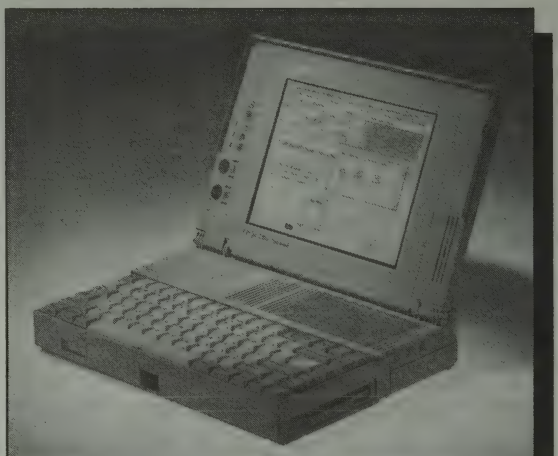

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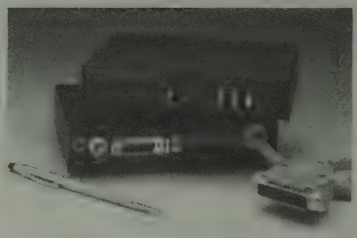
PRODUCT SPOTLIGHT

erly licensed applications software onto The Poqet PC. The card writer/reader, called the ThinCard Drive, is designed for easy installation into the 3.5" bay of a PC XT, AT, or compatible running MS-DOS 3.3 or higher. (1MB cards, $359; 4MB cards, $1400. ThinCard Drive $495) Poqet Corp., 5200 Patrick Henry Dr., Santa Clara, CA 95054. (408)982-9500.

LAPTOP ETHERNET ADAPTER

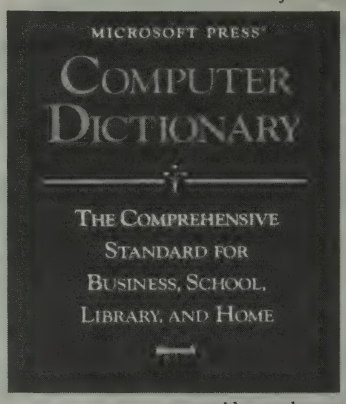
Hong Technologies, Inc.'s Parallel Port Ethernet Adapters are unique, full-featured parallel port adapters that allow you to connect notebook and laptop computers to a network without losing local printer access. The HT-PP108ETP for 10Base-T and HT-PP108ECX for coaxial networks each feature a pass-through parallel port, which allows concurrent network printer access. Each adapter includes a DB-15 connector and a Novell workstation IPX shell driver for easy installation. ($395) Hong Technologies, Inc., PO Box 1268, Mountain View, CA 94042. (415)964-0100.



BOOKS

COMPUTER DICTIONARY

The Microsoft Press Computer Dictionary: The Comprehensive Standard for Business, School, Library, and Home is an invaluable resource for anyone who works with a computer. This handy reference contains over five thousand entries with explanations in plain English. It's perfect for students, managers, and professionals—anyone who needs a quick and reliable guide to microcomputer terms and phrases. Drawings, diagrams, and other graphics enhance many definitions and provide additional detail. All entries are cross-referenced to provide supplementary information and invite further exploration. ($19.95) Microsoft Press, One Microsoft Way, Redmond, WA 98052-6399. (206)882-8080.



THE PC USER'S GUIDE

The PC User's Guide, by Nick Anis and Craig Menefee, is a comprehensive, easy-to-understand guide that seeks to fill the information gap about your PC. The book provides the information you need to set up, operate, and adjust your IBM-compatible personal computer. In the process you'll learn about computer basics, including DOS and BASIC basics, how to run programs, hard disks, trou-

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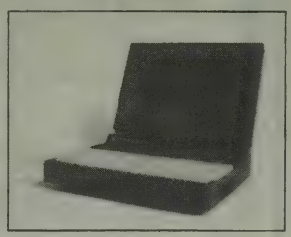

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AT 486 33MHz main board w/128K cache $1,120
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DRAM 41256K (80 nano second) $2.50
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SIM modulers 4MB x 9 (80 nano second) $200
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AT 80387DX 20MHz math co-processor $210
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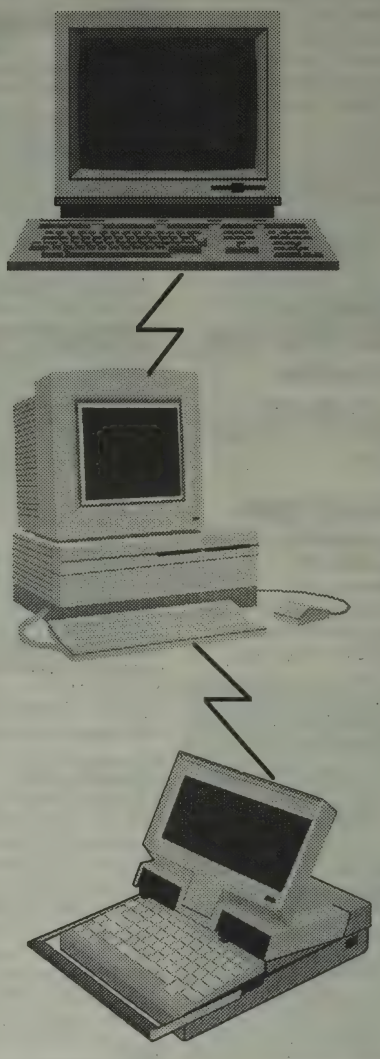

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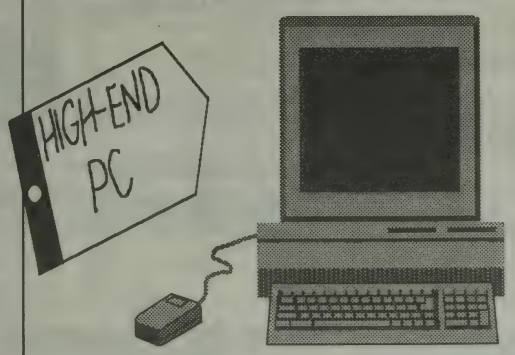

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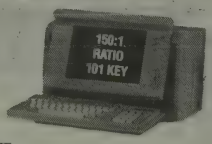

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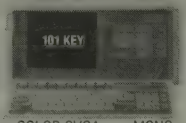

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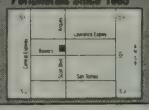

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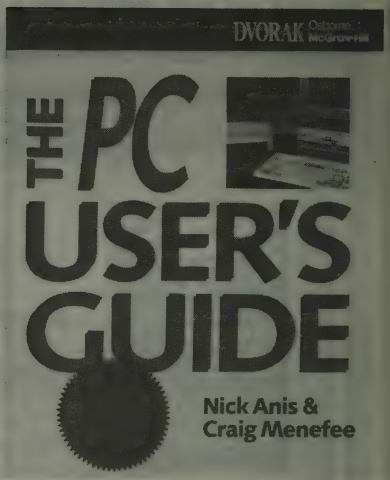

bleshooting, service and repairs, and more. The authors state in the introduction that "this is a beginner's book that guides you into the middle range of PC expertise. It is also a reference book, containing more detail than a simple 'crash course' book." ($29.95) Dvorak/Osborne McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710.

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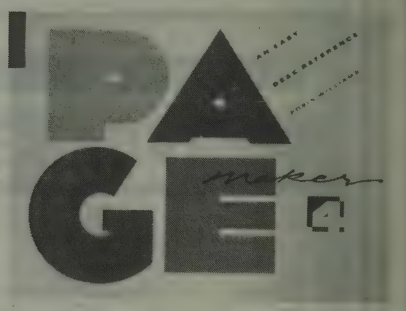
PageMaker 4: An Easy Desk Reference, by Robin Williams, is organized to answer any



PageMaker question. The book features a unique three-column format: column 1 defines a program or task under the heading "If you want to do this"; column 2 shows the steps to perform it; column 3 provides "shortcuts, notes, hints." In addition, "throughout the book are short articles of vaguely relevant interest, stories of Aldus Manutius, Johannes Gütenberg, or some historical curiosity relating to type and printing," according to Ms. Williams. "The articles may make for interesting reading while you wait for your work to come out of the printer." ($29.95) Peachpit Press, Inc., 2414 Sixth St., Berkeley, CA 94710. 1-800-283-9444.

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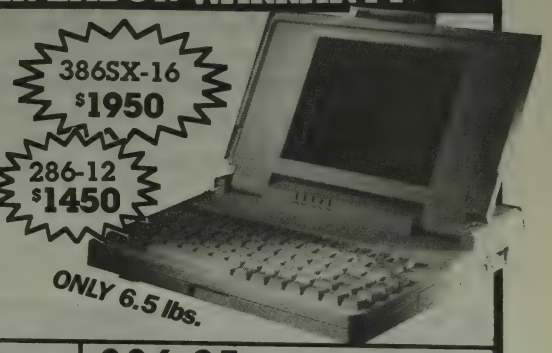

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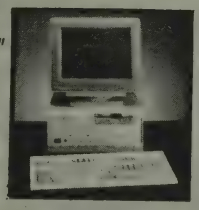

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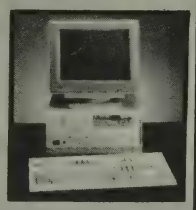

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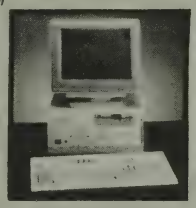

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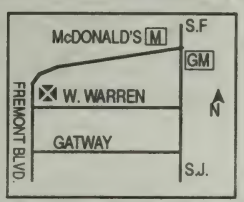

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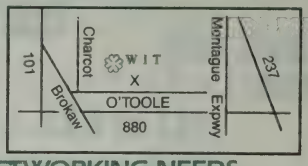

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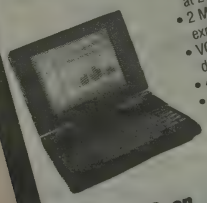

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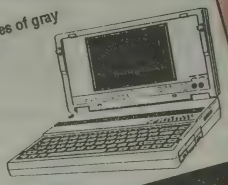

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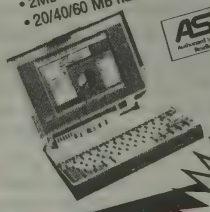

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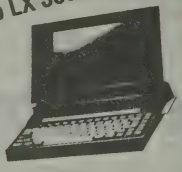

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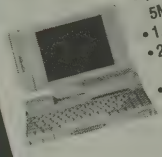

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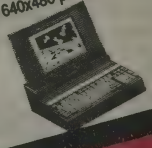

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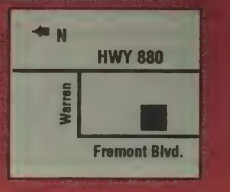

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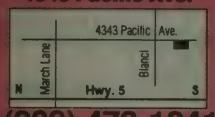

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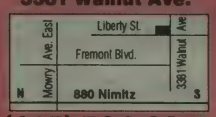

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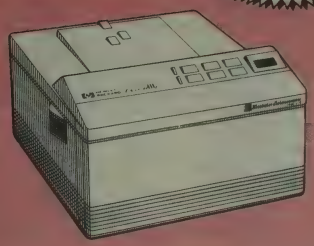

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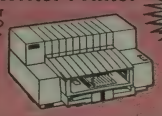

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To earn the Okidata OK, we had to re-invent the laser printer

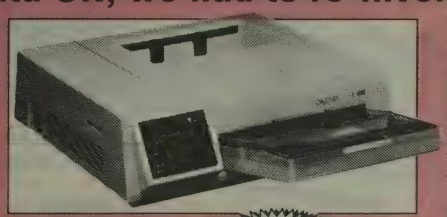
At $599, the Okidata OL400 is the lowest-priced page printer on the market today. What's more, that price includes features you won't find on any LaserJet.

The 4 ppm OL400 emulates HP® Series II for compatibility with most popular software, and comes complete with more standard type faces and more resident fonts, plus a high-capacity paper tray that's optional on the HP-all in a slim, lower-profile design that's less bulky on a desktop.

The Laserless Printhead: Warranteed For 5 Years.

The OL400 also comes with the longest warranty in the industry: 5 years on the printhead, plus 1 year parts and labor on the entire printer. To deliver a warranty that strong, our engineers had to re-invent the laser printer.

To replace the conventional page-printer technology of laser beams, lenses and rotating mirrors, they designed a proprietary, solid-state LED printhead with no moving parts.



And the price: $599

Its All In Our Head.

Besides being inherently reliable, the simpler design of the Okidata printhead also means a straight-line paper path that's less likely to jam—even when feeding envelopes, heavy stock, or labels. And, since we build it ourselves, the cost stays low.

The Okidata OK-A Badge Of Honor

The performance and features of the OL400 were good enough to earn it a PC Magazine Editors' Choice Award. But it also had to earn something else — the Okidata OK.

What's the Okidata OK? Simply our promise that every printer we make will deliver not merely acceptable performance, but out-standing performance — not just good value, but exceptional value.

OKi OK!
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We don't design it to work. We design it to work wonders.

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Okidata ML 390 Plus	434
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4MB Board		239

HP IIP; III; IIID — 1MB Board — 99; 2MB Board — 150; 4MB Board — 215

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2MB Board	189
3MB Board	239
4MB Board	289

Epson EPL-6000; Toshiba PageLaser 6; Packard Bell PP9500; Fact P6060; Mannesmann Tally 905; AT&T 593 Laser; NCR 6435 Laser

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FOR CANON LBP-4

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256XI-100NS	2.00
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113633-001 1-9MB Exp Brd	225
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118689-001 2MB Module	225

DeskPro 286N; 386N

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DeskPro 386/33

115144-001 2MB Module	215

DeskPro 386/33L; 486/25; 486/33L; SystemPro

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116568-001 32MB Module	6000

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118072-001 4MB Kit	399
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118070-002 8MB Exp Brd	1199

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107651-001 1MB Kit	268
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Portable LTE/286

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117081-003 4MB Module	630

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110235-001 1MB Module	190
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6450603 1MB Module	95.00

Mdls 70-061; -E61; -121; 50Z; 55LS; 65LS; 55SX; 65SX; P70; Exp Brd 6450605; 6450609; 34F30xx

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Mdls 70-A21; -A61; -821; -861

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Mac IIci; IIsi

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Mdls 4/330; 4/370

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Mdls Z-386/33; 25; 20

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80286-8 (PLCC)	CALL
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V-20-8	6.00
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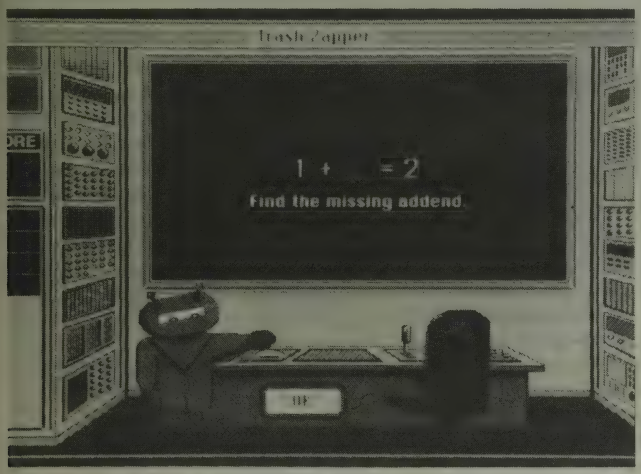
8. Prices subject to change without notice.

HOURS: Mon.-Fri. 8am-6pm Saturday 9am-3pm

Programmed By: David Ely and Kristine Sato
Published By: Davidson, Inc.
For: Macintosh (1MB for monochrome, 2MB for color, System 6.04 or higher, System 7 compatible)
List Price: $59.95 ($49.95 for MS-DOS version)

These four arithmetic practice games are designed for ages 6–12.

You can select addition, subtraction, multiplication, division, fractions, decimals, or percents. There are six levels of difficulty, and many options, including the ability to create your own problem sets. Blasternaut, a cute animated figure, appears in each game. A record-keeping



system lets kids, parents, or teachers keep track of progress, and can even print out little Certificates of Excellence.

In "Rocket Launcher" you gradually assemble the parts of a rocket on a launch pad by entering correct answers to a series of questions. The rocket will not blast off until you get all the answers right.

"Trash Zapper" requires you to find the missing number in an equation such as "10 + ? = 14." Your reward for the correct answer is a chance to zap pieces of trash floating in space.

"Number Recycler" is a tricky game in which columns of numbers must be manipulated to make true equations. It should have an instant appeal to kids who enjoy Tetris.

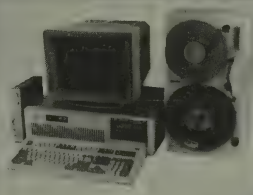
"Math Blaster" presents a math problem with four possible answers attached to space stations floating above your planet. You have to "fly" the Blasternaut to the correct answer.

The great strength of this program is that the classic flash card drill and practice method is embedded in a series of really challenging, enjoyable games. It takes some practice to understand and master the mechanics of play, but that's the idea—trivial, obvious games are not motivating for kids. The quality of the design and animation is impeccable. A comprehensive 78-page manual provides all the guidance parents and teachers would need to use this program effectively. (Davidson, Inc., PO Box 2961, Torrance, CA 90509. 1-800-545-7677)

Continued

Desktop 9-Track Tape Subsystem

Now, 9-track tape lets your micro exchange data with minis and mainframes



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PRODUCT SPOTLIGHT

CHESSNET V2.0

Designed By: Jack Lerner
Published By: Masque Publishing, Inc. (PO Box 5223, Englewood, CO 80155. 303/290-9853)
For: IBM PC with Windows 3.0, supports play over Hayes-compatible modems or NetBios-compatible network. Package includes 3.5" and 5.25" disks
List Price: $49.95

There are many excellent chess programs already available, but Chessnet adds some interesting new features.

There are many excellent chess programs already available, but this one adds some interesting new features. Although the Windows environment adds a lot of computational overhead, performance on a 25MHz, 386-based system was quite brisk. You can customize the chessboard display, the system of notation, and many other variables.

The computer can play either side, at levels from beginner to expert. The program includes files for all twenty-four games from the 1990 World Chess Championship.

To play via modem or over a network you need two copies of the game. It will be interesting to see how quickly Windows becomes the standard for state-of-the-art recreational software.

NEWS & OPINION

According to a recent study released by the Software Publishers Association, 1990 sales of entertainment software in North America totalled $355 million. The "simulation" category, which includes flight simulators and war games, represented 35% of this market. This was attributed to the fortunate conjunction of the Kuwait crisis and the Christmas buying season. Role playing games and arcade/action games racked up shares of 22% and 26% respectively.

A staggering 73% of entertainment software sales were for MS-DOS systems, followed by Amiga with 10% and the good old Commodore 64 with 8%. Macintosh and Apple II presumably account for most of the residual 9%. Apple's lack of support for entertainment software developers is based on its corporate paranoia about being perceived as a maker of toy computers, rather than Serious Business Machines. Ironically, the superiority of the Mac as a multimedia platform could make it a big winner in the entertainment software market. Game programmers have always been at the cutting edge in animation, sound effects, and software tricks to enhance performance.

Apple's contemptuous neglect of this market is unwise.

Spectrum Holobyte is offering a "sampler" of three of its top MS-DOS products for $3.99. Two 1.2MB disks include a playable demo version of Falcon 3.0, an interactive demo of Faces, and a self-running teaser for Stunt Driver. Falcon is a simulation of the Air Force F-16 fighter, and the new v3.0 is scheduled to be in stores in August. Faces, designed by the brilliant Soviet programmer Alexei Pajitnov, is a game of falling blocks that have to be assembled to make portraits of famous people. Stunt Driver is exactly what the name suggests. The demos require an IBM AT or compatible.

PC HARDWARE REVIEW

PARALLEL LINE P4 FLOPPY DISK DRIVE

Manufactured By: Pacific Rim
List Price: $429

BACKPACK

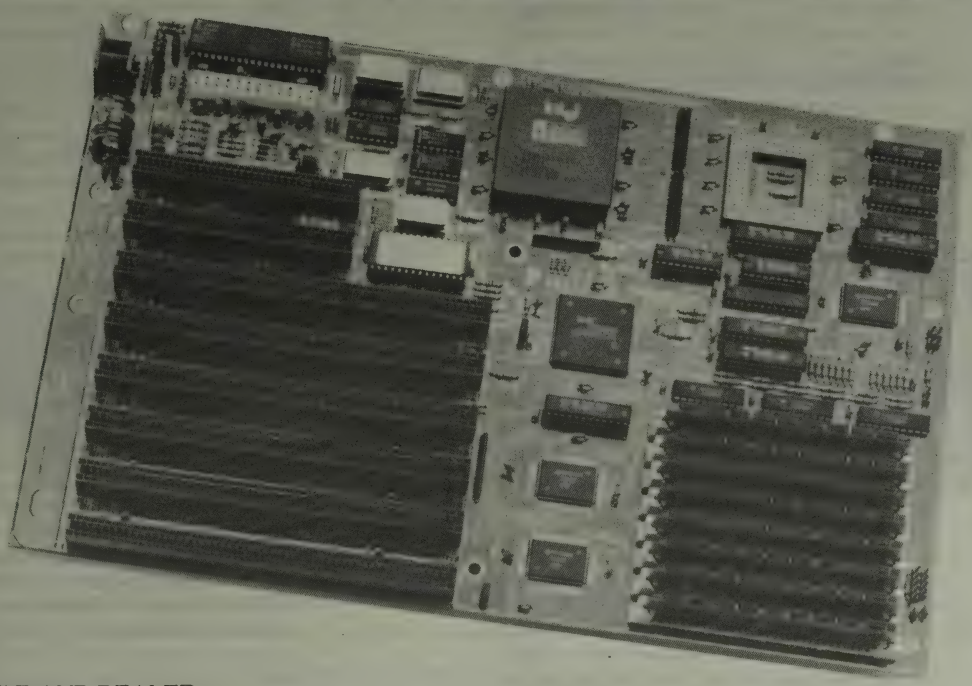
Manufactured By: MicroSolutions
List Price: $425
Reviewed By: Wayne Yacco

The 4MB (2.88MB formatted) 3.5" floppy diskette has been around for some time now without making a splash commensurate with its capacious storage. Now, IBM is about to introduce a deluge of new machines featuring these floppy-drive tsunamis. There are even rumors that Big Blue has been stockpiling Japanese production for months in preparation. And as IBM goes, so goes corporate America. Well, sometimes.

If this turns out to be one of those times, you'll be ordering new machines with these drives in them before long. When you do, and in the meantime too, you'll want to be able to move data from 4MB diskettes to your present computers. But you probably won't want to retrofit all your old equipment

Continued

PAN486-25/33



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COMPATIBILITY:

DOS, OS/2, Windows 3.0, UNIX, Xenix,
OrCad III, PCAD, Novell 2.15, etc. . . .

PERFORMANCE TABLE

	PAN486-25	PAN486-33
LANDMARK v1.14	114.1MHZ	151.9 MHZ
POWERMETER v1.3	11.01 MIIPS	14.66 MIPS
NORTON SI v5.0	54.1	72.1
QAPLUSv.4.21 (Whetstones)	4114.6K	5711.5K
QAPLUSv.4.21 (dhrystones)	15172	22758

SYSTEM SUMMARY:

- INTEL 80486 CPU
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- WEITEK 4167 SOCKET
- TEXAS INSTRUMENT TIGER CHIPSET
- SHADOW RAM
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- MEMORY TYPE 256Kx9, 1Mx9, 4Mx9 SIMM
- MEMORY SPEED: 60ns, 70ns, 80ns, 100ns
- 6 16-BIT AT BUS SLOTS
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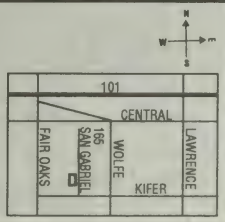
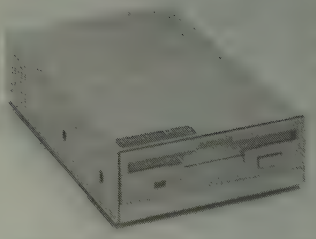


with new drives.

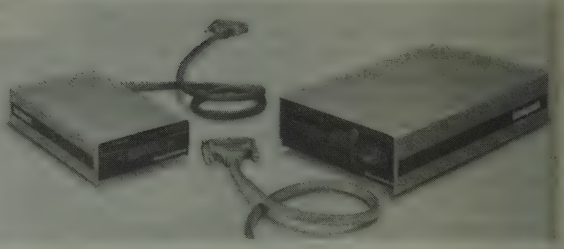
You could get limited compatibility by retrofitting a single machine, and then transferring everything over your network, or to smaller capacity diskettes. However, there's another solution that will be the ideal for many users: an external subsystem. The best of these don't even require a special adapter. They just plug into a standard parallel port. So, you can instantly move them among all of your machines as required.



Both MicroSolutions and Pacific Rim make drives of this type. Each can format, read, and write all 3.5" formats and diskette types up to, and including, the 4MB ED media. They also have a pass-through parallel port that you can use to daisychain drives and simultaneously connect a printer. Both products sent for review were based on Teac drives. In fact they share more: both use the same software (written by MicroSolutions) and even some circuitry.

It's good software too. Other peripherals designed to connect to a parallel port are equally at home connected through the pass-through port on these drives. Misco's DataFile hard disk and the Genovation Keypad II external numeric pad are two devices I tested, and both seem to work with these floppies without driver conflicts. Another included utility works just like the DOS format command, but it uses easier-to-remember parameters and works under older DOS versions that won't otherwise support a 4MB drive.

There are some small differences. The case designs are different, and their power supplies differ by nearly 5V. Backpack also includes a TSR for formatting floppies in the background under DOS. (It's not required if you use Windows.)



I initially experienced some minor problems with these drives. Both vendors diligently corrected them though. Pacific Rim blamed the narrow confines of its case for a problem I was having correctly formatting 4MB diskettes. It is to the credit of their customer-support policies that the cause of the problem was finally determined. After the

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386SX/20 Mono	$734	$859	$909	$1,209	$1,909
386SX/20 Super VGA	$979	$1,104	$1,154	$1,454	$2,154
386/25 Mono	$804	$929	$979	$1,279	$1,979
386/25 Super VGA	$1,049	$1,174	$1,224	$1,524	$2,224

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A386/40C Hires	$1,599	$1,899	$2,599	$3,099	$3,999
486/25C Hires (ISA)	$1,999	$2,299	$2,999	$3,499	$4,399
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third drive they might easily have dismissed me as a computer hypocondriac. Instead, they listened—even when the drives I returned seemed to work fine on their test bench. The problem turned out to be caused by internal radio-frequency (r-f) interference which they weren't experiencing because the drives were factory tested before installing them into their cases. It was only when assembled that the close proximity of components caused the problem on some units. Now they've got it licked, and they promise a fix for any user that runs into this.

MicroSolutions also needed to send a second unit, but not because of interference. Their problem was attributed to a misalignment caused by rough handling during shipping.

The 4MB floppy offers a big storage advantage at a small price. So, it seems likely that the current dribble of drives will soon turn into a flood of floppies. I recommend either of these subsystems as a great way to satisfy your need for high-capacity-floppy compatibility. With Pacific Rim's one problem resolved, there's very little to set these two units apart other than styling. (MicroSolutions, Inc., 132 W. Lincoln Hwy., DeKalb, IL 60115, 815/756-3411. Pacific Rim, Inc., 2655 Barrington Ct., Hayward, CA 94545, 1-800-722-7461, 415/782-1013 in California. Genovation, Inc., 17741 Mitchell N., Irvine, CA 92714, 714/833-3355. Misco, Inc., One Misco Plaza, Holmdel, NJ 07733, 1-800-876-4726, 201/888-9300.)

PC SOFTWARE REVIEW

RAPIDTEXT

Published By: RAPIDTEXT, Inc
List Price: $3995 for software
Reviewed By: Birrell Walsh

I went to see a real-time computer interpreting service for the deaf called RAPIDTEXT. It was being demonstrated to Deaf Services Network North, in San Francisco.

RAPIDTEXT connects a steno keyboard to an IBM-compatible XT computer that is using WordPerfect. Because it is possible to record speech in real time, the deaf can watch what is being said by watching the transcription as it is made. The words appear on the monitor, or you can interpret for a group of people using a video projector.

A steno operator can take dictation in English at speeds up to 260 words a minute, using any of several existing stenographic methods which RAPIDTEXT supports. Artificial intelligence permits the program to search for abbreviations in specialized dictionaries that are tailored for special fields: medical, legal, or other. The transcription is a WordPerfect file, giving you all of WordPerfect's editing and formatting features, and allowing you to

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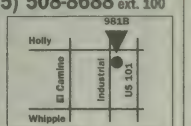

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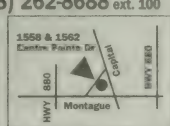

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easily print your notes.

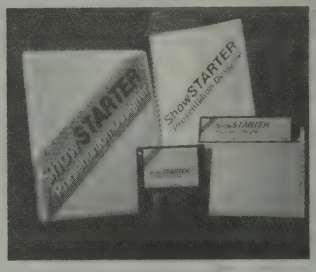
The RAPIDTEXT system can serve both those who are born deaf (who may be bilingual in English and American Sign Language) and those who are deafened later in life and know only English.

A skilled stenographic operator is needed to get value from RAPIDTEXT. The sign-language interpreter who was interpreting at the presentation was faster and more accurate than the student stenographer who was using the RAPIDTEXT system. Thus, institutions, such as schools, public agencies, and libraries, which deal with the deaf and can afford a professional-quality stenographer will find this system the most useful. The RAPIDTEXT people say that it is not only for real-time captioning, but you can also use it to put closed captions (which require a caption-decoder) on video tapes, if you have two VCRs.

The RAPIDTEXT software is $3995. There are a number of steno machines which will work with it. RAPIDTEXT provides one for $1200. The total is $5200, in addition to the cost of WordPerfect and the computer. Site licenses are available to schools or universities for the same price as a single software package. (RAPIDTEXT, Inc. 18013 Sky Park Circle, Irvine, CA 92714. 714/261-6333)

SHOW STARTER PRESENTATION DESIGNER

Published By: MediaNet
List Price: $89
Reviewed By: Woody Liswood



Show Starter is one of those specialized little programs that if you need it, works wonders, and if you don't, you may wonder why on earth would anybody want something like that. Do you make presentations in front of groups? Do know how long your presentation must be and who will be in the audience? If you know the answers to these and other questions, then Show Starter may help you.

Show Starter is an expert system hidden as a program. It takes information about your audience, the objectives of your presentation, and provides you with a report that gives you information about how to put together the presentation to have your desired impact.

Show Starter asks you ten questions. The documentation says that it considers "Nearly two million possible considerations." I don't know if it does, but it does give useful information to help get your presentation started. For example, it makes suggestions for typefaces, sizes, and colors.

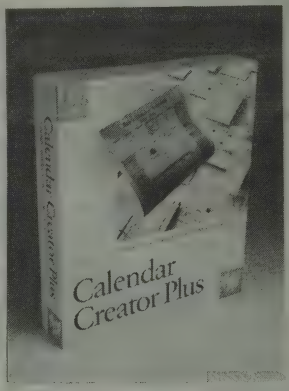
As a consultant and manager, I have done presentations for the past twenty years. I was in the habit of changing color frequently. Show Starter, however, recommends that I use the same background color for all of the slides and if I really want to change colors, stay within the same color family. Show Starter also suggests changing colors to present another idea or a complete change of thought. I guess I'll be redoing my old presentations to get them more in line with Show Starter thinking.

Interestingly, Show Starter told me that because nearly 20% of all men suffer from a red/green deficiency, avoid using those colors when presenting to a mostly male audience. There is a detailed discussion about color problems and trends in the documentation.

All in all, if you do presentations, Show Starter may be just the thing to remind you to dot all the i's and cross all the t's. (MediaNet, Inc., 305 Madison Ave., Suite 564, New York, NY 10165. 212/682-2250, 1-800-745-7469)

CALENDAR CREATOR PLUS V4.0

Published By: Power Up Software
List Price: $69.95
Reviewed By: Woody Liswood



If you need a calendar, for business, home appointments, or almost anything else, Calendar Creator Plus is one of the best around. It lets you enter special events and print your calendars in a variety of formats to fit your needs.

Calendar Creator Plus lets you use not only the month-at-a-glance approach, but can also display your calendar in single days, weeks, six-week blocks, and entire years. It also works with different page sizes such as regular typing paper, and the different organizer and pocket organizer sizes. To make things even better, you can purchase many of

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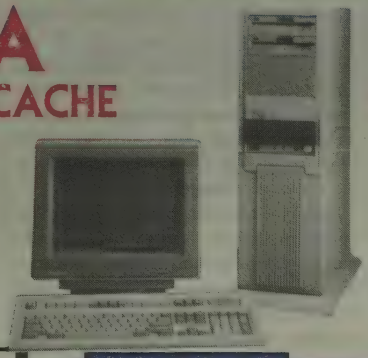

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LANDMARK = 21

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PRODUCT SPOTLIGHT

the odd sizes in continuous feed or laser printer paper directly from Power Up.

Version 4 uses AGFA Compugraphic fonts, coming standard with Times and Triumvirate. (Additional fonts are available.) Events can also be set in bold, italic, or bold italic. And, if you like icons, you can place them as an image in the calendar. Calendars can be exported as PCX files, letting you import them into other programs.

My main criticism here, as with other Power Up products, is that it does not support Postscript printing. It does support a wide variety of dot matrix printers and some laser printers, so Calendar Creator Plus will probably work for you. (Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. 415/345-5900)

MACINTOSH SOFTWARE REVIEW

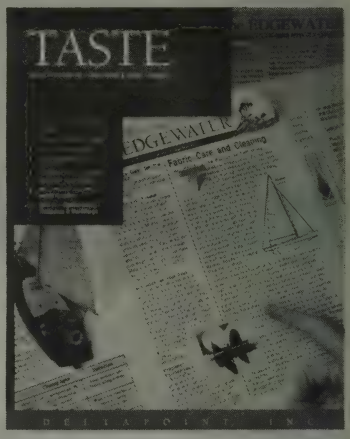
TASTE

Published By: DeltaPoint
List Price: $149
Reviewed By: Tony Rocco

I never thought I would be blown away by a word processor again. What could anyone possibly think of that Microsoft, WordPerfect, Claris, T/Maker, et al, haven't already done? Well, DeltaPoint, makers of DeltaGraph, have done it.

Called Taste 1.01, this piece of software offers everything anyone not needing serious document production capabilities could want in a word processor, including those all-important style sheets. In fact, these are the first style sheets I've seen that compare to Word's. Set text and paragraph formats, give them names, then select them from a pop-up menu on the ruler, at the bottom of the screen, or from the Format menu. Easy and very useful.

Another hot feature is mail merge. My idea of word processing hell is putting those little <<>> around field names in a



merge letter. DeltaPoint has found a smart way to do this easily and intuitively. You load a tab-delimited data file from your database application into Taste and enter each field name into your document by choosing it from a floating window. Place the cursor in the document where you want <<Name>>, <<Street>>, <<City>>, and so forth to appear, double-click on the field name, and it appears in the document with the needed markers. No muss, no fuss. Another handy dandy feature is the built-in address book that makes performing a mail merge even easier.

One thing that every word processor should have is the ability to insert a file into a document. In Taste, you can open a file and insert it wherever you place the cursor.

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PRODUCT SPOTLIGHT

Taste comes with seven MacLink Plus conversion files, and you can add any others you may require. Unfortunately, I had a lot of trouble opening Word 4.0 files. In most cases, in fact, they wouldn't open.

If you like graphics, Taste has graphics. You can draw all over the place in the graph layer and even create bezier curves *a la* Illustrator. You can lay out your text in multiple columns and you can wrap text around and within graphics. The text wraparound capabilities of this application are really impressive.

Add a spell checker, thesaurus, word and character counter, footnotes, a page preview feature, and an intuitive look and feel and you have one hot little program. (DeltaPoint, Inc., Monterey, CA 93940. 408/648-4000)

LEARN TO SPEAK SPANISH (2 CD VERSION)

Published By: Hyperglot Software
List Price: $99.00
Reviewed By: Matthew Leeds

Learning to speak a foreign language is tough. Even tougher is getting your accent right and learning to understand the language when spoken at normal speed by a native speaker. Practicing with a patient teacher can make a real difference, and your Macintosh is about as patient as they get. Hyperglot's Learn to Speak Spanish program brings the voice of native speakers into your home or office.

The program uses Hypercard stacks to take you through thirty lessons composed of reading situations, dialogues, listening exercises, drills, cultural notes, and grammar exercises that all take good advantage of the random access nature of CD-ROM. For example, you can click on any word or phrase and hear it spoken instantly. The set of lessons is structured around real-life situations, so you develop a vocabulary that is immediately useful.

The stacks are supplied on one CD, and the audio is on the second CD. You copy the stacks on the first CD (about 10MB of hard disk space is required for this, although no mention of this requirement is made on the package) to your hard disk, then put the second CD in your CD-ROM drive. The version I used had Hypercard v1.2 stacks, but came with a conversion program to convert them to v2.0. The conversion process is no fun—you must sit and click on an OK button for each stack during this process. (A new version with Hypercard v2.0 stacks was released in late July.) There are also versions for those without a CD-ROM drive but who have a CD player, or who only have an audio cassette player, although these versions do not offer computer control over the audio portion of the lessons. (Hyperglot Software, Inc., PO Box 10746, 5108-D Kingston Pike, Knoxville, TN 37939. 615/558-8270) ■

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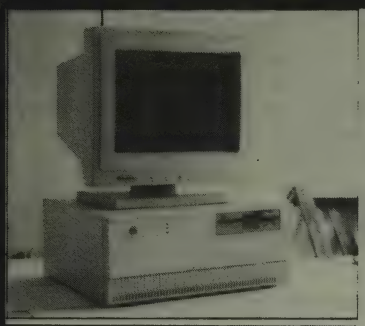

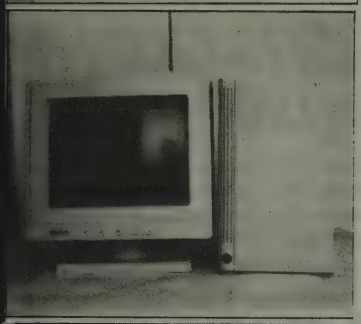

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** Same configuration as the 386-33 MHZ CACHE

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CREATIVE TOOLS

Image Compression On The Mac

Now That You've Got Those Great Graphics, Here's How To Make Them Fit On Your Disk

BY MATTHEW LEEDS

Moving images from videotape to a computer has become an integral part of multimedia today. Additionally, scanners make it easy to also use graphics from prints, transparencies, still video cameras, and flat art. Nonlinear video editing systems also digitize an enormous quantity of still imagery. This has created a tremendous storage problem.

A single frame of video requires about a megabyte of storage space. (A 640 x 480 pixel image at 24 bits of color needs 640 x 480 x 24/8, or 921,600 bytes of storage; if you store it as a 32-bit image, the required space increases to 1,228,800 bytes). At 30 frames per second, a few seconds of video can easily overwhelm a large hard disk. Even the storage requirements of a single frame can pose problems. It may not fit on a floppy disk, and sending it over a modem could incur a hefty phone bill. The simple answer to this problem is image compression.

A variety of image compression techniques have been in use for some time. Some of them have been used in video teleconferencing, others in satellite telemetry, and still others in data compression on personal computers.

Compressing image data poses special problems. Since most technology has focused on retaining all of the original data in a source, the efficiency of compression has been modest. The few compression strategies that have allowed for the loss of data are too crude or too slow for multimedia applications. Innovators in the industry had to look beyond existing compression methodology.

THE JPEG STANDARD

In the early 1980s, a group of leading image companies formed the Joint Photographic Experts Group (JPEG), as a subcommittee of the ISO and CCITT standards organizations, to develop and standardize an efficient method of compressing continuous tone images. Although their focus was originally on the use of photographic images in videotext systems, it was expanded to include other applications. They gave additional consideration to support for a variety of pixel resolutions, color spaces, and transmission bandwidths; they paid special attention to efficient implementation in both software and hardware for this evolving compression standard.

Last year saw the release of the first commercial products to implement the evolving JPEG compression standard. This year a host of compression products, some that support JPEG and some that do not, are available. They vary in price from under $200 to over $1,000 for hardware-based solutions. It's certain that these prices will fall over time, and in fact some compression technology may make its way onto the motherboards of computers in the near future. In the meantime, making sense of the competing claims and deciding on the appropriate product for your application require an understanding of the underlying technology.

The JPEG compression process can be divided into three basic stages:

1) The removal of data redundancy via the Discrete Cosine Transform (DCT).

2) The removal of data (quantization) unneeded by the human visual system.

3) The compacting of the remaining data via Huffman encoding.

In the first step, most JPEG implementations first convert an RGB color image to chrominance and luminance (YUV). This conversion allows for greater compression, and also comes closest to reproducing the way the human visual system sees image information. Next, the image is divided into blocks of pixels, and an average value is computed for the initial block. Each subsequent block's value is expressed relative to the initial block. This allows for the removal of redundant color frequencies and minimizes the data required to define each block.

The second step removes the high-frequency (visual frequency) data. This is done by dividing each block of pixels by a value in a quantization table. The selection of values in this table greatly affects the degree of compression and the retention of visual detail in the final image. The magnitude of block values is reduced via this operation, and the results are rounded to the nearest

At 30 frames per second, a few seconds of video can easily overwhelm a large hard disk. Even the storage requirements of a single frame can pose problems. The simple answer to this problem is image compression.

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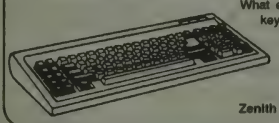
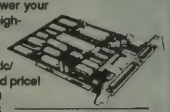


What else is there to say? An 84-key XT-compatible keyboard with Caps, Num and Scroll Lock Status LED's for the low, low price of $24.95! Standard IBM layout, coil cord, 5-pin DIN plug, made for Zenith Data Systems, new in shipping carton, 90-day warranty. Get 'em while they last!

Zenith XT Keyboard HSC#12479 $24.95

Everex Magic I/O Card for AT's...



...at a magic price! These I/O cards quickly and inexpensively answer your needs for ports on your AT. This one card provides a parallel port and a high-speed AT serial port, and has room for another serial port (optional with Second Serial Kit). Port addresses and interrupts are selectable for configuration with nearly every IBM compatible system, and a diagnostic/setup utility is included on disk. Genuine Everex quality at an off-brand price!

Everex Magic I/O EV170A HSC#12341 $17.50
Everex Second Serial Kit HSC#12351 $4.95

EVEREX

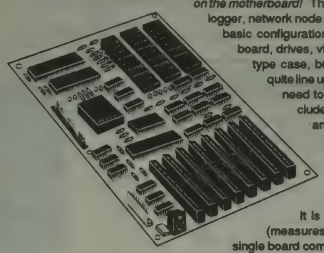
20 MB Conner SCSI Hard Drive Special!

Those of you looking for an inexpensive second SCSI Hard Disk Drive will want to look no further! Those of you who are in-the-know will recognize the name Conner Peripherals as a manufacturer of rugged, high-quality disk drives. These low-profile 3.5" drives (model CP3020) are only 1" tall! They are a 2-head, 626-cylinder configuration and have a 25 mS access time. These drives are like new, having been pulled from unused equipment, and carry a 90-day HSC warranty. HSC #12385

$129.00

PC Compatible Motherboards... ..with a difference!

Forget about the run-of-the-mill PC Compatible Processor boards you have seen elsewhere... HSC has some XT and AT type boards that offer features not found anywhere else, especially at these prices! The first item shown below is an eight-slot switchable 4.77/7.15 MHz 8088 (XT Compatible) motherboard that is the same size as a regular IBM motherboard. The bonus is that the floppy controller, two serial ports and a parallel printer port *are included on the motherboard!* This would be a perfect board for a data-logger, network node or other computer that is needed in a basic configuration...just add RAM (up to 640K), keyboard, drives, video and go! It will fit in a normal XT type case, but the keyboard connector does not quite line up with the hole in the case, and you will need to put a different power connector (included) on your power supply. Only $29.95 and it is made in the USA by Faraday Electronics. Comes with 20 page users manual. HSC #12427

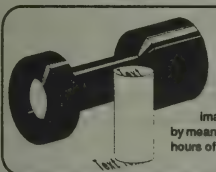


The second item (not shown), is for those needing a space-efficient AT Compatible computer. It is a seven-slot passive AT backplane (measures 6" x 7.5") with a Qualogy QPC-5132 single board computer to plug into it. This new-in-the-box card features a 16 MHz 80286 (running at either 12.5 MHz with no wait-state or 16 MHz with one wait state), one parallel port and two serial ports (one of which can be RS-422), keyboard interface (needs DIN adapter), Dallas battery-backed clock/calendar, co-processor socket and room for up to 4MB RAM using 1Meg SIMM's (not included). It also has a Watchdog timer feature that will reset the computer when it "hangs", making this the perfect board for unattended operation (like a BBS). The BIOS is a PC/AT compatible AMI version, with extra test features requested by the original customer for this board. It has the usual ports for speaker, keylock and reset. This board was also made in the USA, and lists to OEM's for $695.00! Our price with the passive backplane and a 29-page manual is $195.00! HSC #12437

XT Compatible Motherboard, with on-board floppy, serial & parallel ports
HSC #12427 $29.95
AT Compatible Single-Board Plug-in Computer Card with Backplane
HSC #12437 $195.00

XT and AT are registered trademarks of International Business Machines Corp.

Optic Novelties almost gone...this is your last chance!



Here is a good reason to keep checking in with HSC to see what's new...an image-transmitting collimated Fiber-optic rod! This is a chunk of glass 1.1" dia. x 4.1" long that has some amazing optical properties. It is made up of millions of tiny (5 micron) glass strands fused together into one solid piece of glass, polished to an optical flat on either end. When an image is focused on one end, or when the rod is set directly onto a piece if paper with an image, it transmits the image to the other end with astounding resolution. It's as if the image just jumped to the other end of the rod! This optical marvel is from some piece of government contract gear (probably involving an infra-red image converter tube) that must have cost a fortune, but our price is sure to intrigue you. Each rod is held in a beautifully machined aluminum housing (2 3/4" dia. x 6 5/8" long) by means of RTV Silicone at one end, but the rod may be pushed out after carefully cutting the adhesive with a sharp blade. It will make a great executive desk-top plaything, providing hours of introspective focus. If you find a clever use for one, let us know! Shipping weight approx. 2 lb. HSC #12154

$39.00

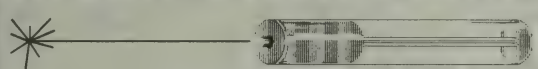
One-Offs...Oddments... Objets d' High-Tech

These items might be gone by the time you read this, but they are indicative of our varied inventory:

Liconix 4207N 40mW Helium-Cadmium (bright blue!) Laser & Power Supply $1295.00
Varian Aerograph Model 400 Gas Chromatograph with Model 485 Recorder interface, Houston Instruments Chart recorder, manual $495.00
Carl Zeiss Standard 4" x 4" Trinocular Microscope, 2 ea.12.5x Eyepieces, 4x, 8x, 16x Objectives, Lamp Head, No Power Supply $995.00
Vickers Photoplan Line-Width Measurement System (Binocular Microscope with Digital Readout) 12.5x Eypieces, 10x, 63x Objectives, Lamp Power Supply, Readout $750.00
Applied Materials Reflectometer I (2 each) $49.00 ea.
Leeds & Northrup Model 8686 Millivolt Potentiometer (EMF or TC inputs) 2 ea. $23.00 ea.
Ultratech Model 600 Plate Cleaner (well used, unknown condition) $49.00
B & K Model 1076 Television Analyst, all cables & slides, manual, vintage but in exc. cond.! $49.00

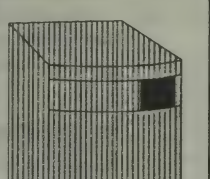
HSC's Laser Kit is Back... ...at it's best price ever!

The kit that broke the price barriers for lasers is back, and now it is the best offer yet! Our own custom designed PC board measures 2.25" x 8" and comes with most of the components you will need to get a Helium-Neon laser up to 4 or 5 MilliWatts running on 100 VAC input. All you need to supply is an enclosure, AC cord and switch, and ballast resistor (different for every tube). You should not attempt this kit if you have not built kits before and developed good soldering technique. It is not difficult, but requires excellent solder joints to work properly. Our regular price for the kit is $45.00, but while stock lasts, you can buy the kit and a 1 - 2 MilliWatt laser tube (used) for $50.00! The tube comes with a mounting bracket and Alden connector, and while you can cut the connector off and solder the wires directly to the PC Board, you may want to buy a mating connector for $5.95.



Laser Power Supply Kit HSC#80003 $45.00 Add $5.00 for HSC#11258 1 MW Laser Tube
Female Alden High Voltage Connector (Mates with above tube) HSC#12457 $5.95

The Lowdown on a great Subwoofer!



Here is something HSC does not get every day...Audio gear! This ADC Soundshaper Subwoofer (Model 3015) is small in size (11" x 7.5" x 17") but big on performance. Feed the output of both channels from your stereo amplifier into it, and then hook your left and right satellite speakers onto its output terminals. The first-order crossover sends frequencies from 110 Hz and above to the satellites, and the 41 to 165 Hz band is reproduced by the 8" dual voice coil, high-flux driver. It can handle 150 Watts peak, 50 Watts RMS into 4 ohms impedance. The cabinet is a high-fashion metallic charcoal black, with a structural foam noryl front cover and black textured vinyl over high-density particle-board sides. The sensitivity is 88 dB +\- 1 dB (1 Watt at 1 Meter) and the whole unit weighs 15.5 lbs. These are brand new in the carton, and sell for $99.00, but only while they last!

ADC Subwoofer HSC#12480 $99.00

More Laser Goodies for Advanced Experimenters

Epoxy Encapsulated Laser Power Supplies:

HSC#	Input	Output	Size (in inches)	Price	Code
80005	110/220 VAC	1.4 - 2.6 KV, 4 - 7 mA adj.	4.25 x 3.25 x 1.125	$129.00	NA
12442	110/220VAC	1.75 KV, 5 mA	4.25 x 3.25 x 1.125	$ 65.00	UAT
12468	110 VAC	1.8 KV, 3.7 - 5 mA adj.	6 x 1.5 x 1.125	$ 69.00	UA
11240	21 - 36 VDC	1.5 KV, 5 mA	4 x 1.5 x 1.125	$ 39.00	UA
11241	21 - 31 VDC	1.1 - 1.5 KV, 3.5 mA	4 x 1.5 x 1.125	$ 39.00	U
80000	10 - 14 VDC	1.6 - 2.6 KV, 4.6 - 6.5 mA adj.	3.75 x 1.5 x 1	$129.00	NA
80015	9 VDC	1 - 1.5 KV, 5.2 mA	4.25 x 1 x 1.5	$ 49.00	NS
80004	7 - 9.6 VDC	900 - 1.8 KV, 4.5 mA	2.125 x 1 x .625	$129.00	N

Codes: U = used, N = New, A = Alden HV Connector, S = Spade HV Terminals, T = Requires 5VDC Trigger input

Helium-Neon Laser Tubes:

HSC#	Output Power	Size	Conn.	Mounting Style	Price
12477	2 milliWatt nom.	9.5" x 1 - 1.25"	None	Bare Glass	$19.95
12478	1 milliWatt nom.	5.75" x 1"	None	Bare Glass	$19.95
11258	1 milliWatt nom.	10.5" x 1.25"	Alden	11" Steel Bracket	$14.95
12387	5 milliWatt nom.	16.25" x 1.75"	AMP	Aluminum Tube	$79.95

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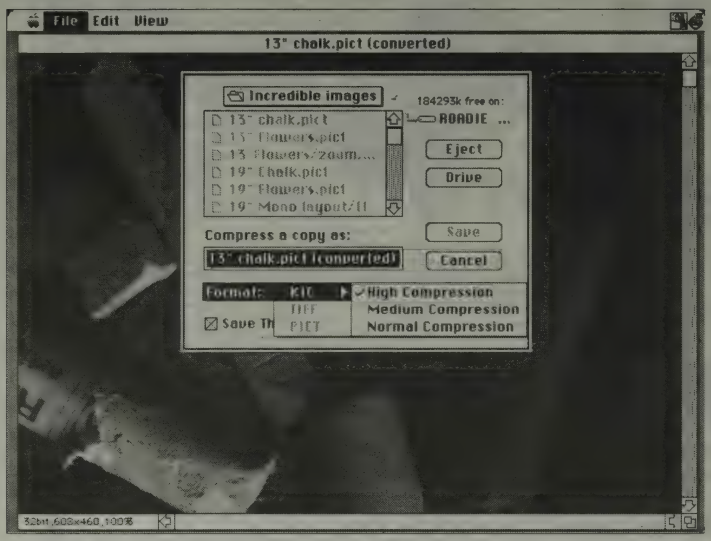

Kodak's Colorsqueeze lets you save images in various formats and compression levels.

Table 1

PicturePress Hardware & Software

Compression mode	Excellent	High	Good	Fair	Lossless
Compression time in seconds	15	9	7	4	105
Decompression time in seconds	6.5	3.4	2.9	2.2	80

PP Software Only

Compression time in seconds	65	40	30	26	105
Decompression time in seconds	64	36	31	28	80
File size in KBytes	260	127	61	29	843
Compression ratio	4:1	8:1	17:1	34:1	1.2:1

Colorsqueeze software

Compression mode	Normal	Medium	High
Compression time in seconds	65	60	50
Decompression time in seconds	55	50	45
File size in KBytes	273	147	54
Compression ratio	4:1	7:1	19:1

ImpressIt

	As Auto Decompress					
Compression setting	25	17	13	8	4	13
Compression time in seconds	25.9	13.8	11.4	9.2	8.4	13.8
Decompression time in seconds	17.7	10.9	9.7	9.1	8.8	50
File size in KBytes	779	214	112	50	27	137
Compression ratio	1.3:1	4.8:1	9.2:1	20.3:1	37.2:1	7.5:1

Notes: The names of the compression modes vary between the products, but from left to right in the table image quality decreases, file size decreases, and interestingly enough, compression and decompression times decrease (excluding PicturePress's Lossless mode and ImpressIt's Auto Decompress mode). The original file size was 1035 KBytes. This was a scanned image with a size of 584 x 604 at 72dpi and 32 bits, tested on a Macintosh IIci with 5MB of RAM and a 24-bit video display card. The PicturePress hardware tests were conducted within Photoshop using the Export and Acquire functions and the PicturePress drop-in module. All times include time to load or save file.

integer. As a result, the data matrix contains only small integer numbers with a high occurrence of zeros.

The third and final stage is to compress the data matrix using Huffman encoding. No data is lost in this process, but considerable compaction does occur. Huffman encoding looks for runs of consecutive numbers and replaces them with a single symbol. For example, a run of fifteen zeros would be replaced by the symbol 101. Instead of needing fifteen symbols to represent the run, we now need only three.

As you can see, JPEG compression requires a tremendous number of calculations. It is possible to do JPEG compression solely with software on a stock computer, but for the best performance or for work in a high-volume production environment, a hardware-enhanced implementation is better.

I had the opportunity to test three JPEG products for the Macintosh: PicturePress from Storm Technology, Colorsqueeze from Kodak, and ImpressIt from Radius. Colorsqueeze and ImpressIt are software-only implementations; PicturePress is available as either a software-only or hardware-enhanced JPEG compression product. The results of my tests are summarized in Table 1.

COLORSQUEEZE

Kodak's Colorsqueeze is an easy-to-use image file compressor. It works with TIFF and PICT files, the two most common graphic file types on the Mac. Compressed files are stored in a new format called KIC. Kodak hopes that other software manufacturers will license the routines to read (and perhaps write) KIC files.

Colorsqueeze is run chiefly from its file requester. It's here you select the file you want to compress or decompress and the desired level of compression. You also have the opportunity to view a thumbnail-sized preview of compressed files, and see information on the file size and type. Saving thumbnail previews is optional and adds about 15KB to the size of a compressed file.

If you are running on an 8-bit video display, Colorsqueeze offers the option of displaying files in a dithered mode. This gives a better representation of the actual colors in the image. Since Colorsqueeze converts all files into 32-bit images, some files may not be reduced in size when compressed.

Colorsqueeze uses virtual memory and requires free space on the hard drive equal to 1.33 times the original file. This virtual memory technique makes Colorsqueeze an excellent choice for working on a minimum-system workstation.

Also included is a freely distributable decompression module. This lets you send disks with compressed images to anyone. The decompress module converts compressed graphics into PICT files.

PICTUREPRESS

Storm Technology's PicturePress is available as either a standalone software package or as a combination of hardware and software. The hardware is a NuBus card that contains two AT&T DSP16A digital signal processor chips. These are clocked at 60MHz and are capable of a peak performance of 60MIPS. Since the DSP chips are programmable, new PicturePress software will be created that supports both existing compressed files and the final JPEG standard, thereby avoiding the problem of putting current JPEG algorithms in silicon now, while the standard is not in final form.

In addition, since the same software is used regardless of whether the hardware is installed, it's possible to compress a file at one workstation equipped with the hardware (at high speed) and decom-

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press it elsewhere through software alone.

PicturePress only reads and writes PICT files (as well as its JPEG file support). It does include a freely distributable decompress-only module that you can supply with any file you've compressed, as well as a plug-in module that works with Adobe's Photoshop. This lets you compress and decompress images directly from within Photoshop. Since Photoshop will read a variety of image file formats, this provides the user with image compression for a much wider range of file formats. Storm Technology plans on providing plug-in modules for other popular graphics programs in the future.

PicturePress also supports an extension to JPEG, called JPEG++. This lets users compress different areas in the image at different ratios. For example, a foreground object in a picture can be compressed at a lower ratio to maintain image quality while the background is compressed at a higher ratio.

PicturePress also supports saving a thumbnail of a file when compressing it. You can modify the quantization table in PicturePress, and the program will also generate custom Huffman tables; these produce greater compression ratios, but take longer to compress. There does not appear to be any way to save these custom tables.

Working with PicturePress when the hardware accelerator was installed was a dream. Loading and saving compressed files from within Photoshop was often faster than loading and saving files without compression. At the high and good ratios in particular, the tradeoffs between file size, time, and image quality made it clear that this was a technology whose time had come.

However, you should plan on a hefty outlay for a suitable system. The 5MB Mac I used for the tests ran into memory shortages several times during my experiments with PicturePress. Eight megabytes would be a more suitable environment, and more than that will soon be required. Since PicturePress has no built-in virtual memory management, Storm recommends the use of a third-party virtual memory product.

An upgraded version of PicturePress is in the works. It will add support for grayscale images, take advantage of System 7.0's virtual memory, and add TIFF file and ImpressIt file decompress support.

RESOURCES:

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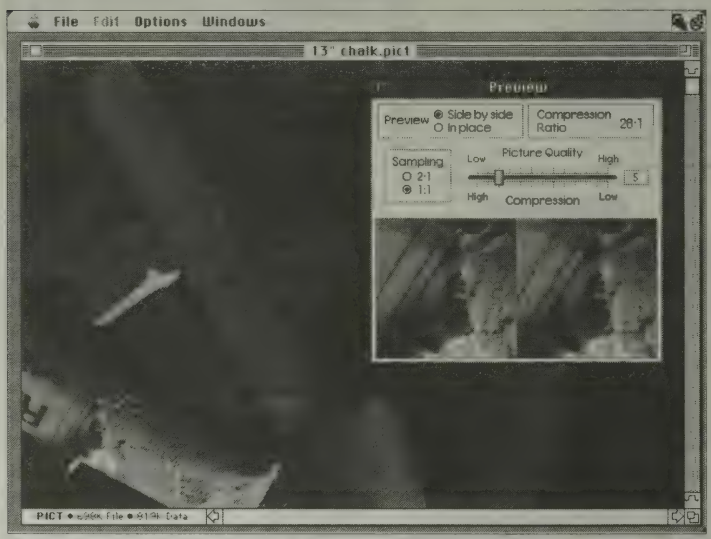

Radius Impressit lets you preview compressed and uncompressed versions of the same image.

IMPRESSIT

ImpressIt, from Radius, offers speed approaching that of the PicturePress hardware version. This alone makes it a powerful alternative to other compression products, but ImpressIt adds a remarkable preview feature as well.

The Preview Window offers two side-by-side views of the image being considered for compression. In one view portion, the image appears uncompressed, and in the other the same portion is shown in its compressed state. Both views are magnified to twice normal size. You select the portion of the image by moving the cursor around on the screen; the preview occurs in real time. You can change the compression level (and the image quality of the compressed image) by moving a slider in the preview window.

JPEG compression requires a tremendous number of calculations. It is possible to do JPEG compression solely with software on a stock computer, but for the best performance, a hardware-enhanced implementation is better.

An option in the preview lets you dispose of the two views in favor of a small square that you can position anywhere in the image on-screen. The portion of the image contained in the square is shown as it would look compressed and then decompressed. This preview also occurs in real time. The combination of this instant preview and slider control over the compression level lends a sense of complete control over the compression process.

You can also select a rectangular portion of the screen to save; however, if the image is larger than your screen, you're stuck, as the screen will not auto-scroll while you're making your selection.

ImpressIt opens and saves PICT, TIFF, and its own JPEG files. You can save a thumbnail of the original image with the file. This thumbnail shows up in ImpressIt's open file dialog. You can also create self-decompressing files, eliminating the need for a separate decompress program, but adding about 20KB to the file size. A virtual memory routine is used to display, compress, and decompress images larger than available RAM; it requires free hard disk space about 1.5 times that of the image. A plug-in for Photoshop is included in the package, although the plug-in does not support the preview or thumbnail features.

ON THE HORIZON

All these products do an excellent job of image compression. In ratios

Continued on page 206

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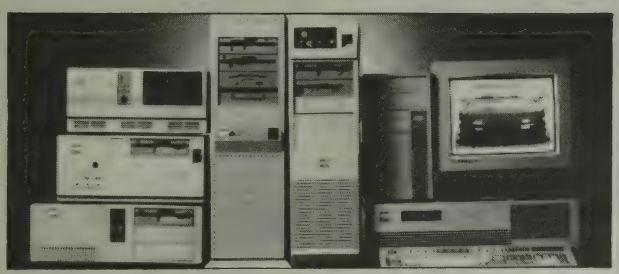

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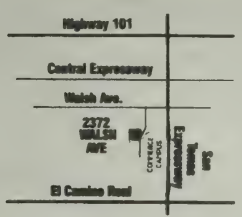

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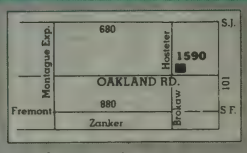

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Nintendo Vs. Galoob

Why BMUG Got Involved, And What It Means To Computer Users

BY DAVID MORGENSTERN

Summer in the City by the Bay is a lot like camping in the mountains. At night we gather around the campfire—not to roast marshmallows, but to keep warm. When it gets too cold in front of the Mac II, I turn on my trustworthy Mac 512E and warm my fingers over the toasty flyback transformer. I'm having a hard time persuading my wife that a computer is not a 21st-century bed warmer.

NINTENDO CULTURE?

The Ninth Circuit Court of Appeals ruled in July on a year-long injunction preventing Lewis Galoob Toys, a local toy manufacturer, from marketing a Nintendo Entertainment System (NES) add-on product, the Game Genie. Game Genie is a hardware adapter that lets users change settings in the games they play—in other words, cheat. Nintendo claimed that the device infringed on their copyrights, and that Genie's sales would damage the market for Nintendo games. Galoob's product also supposedly created a derivative work, directly based on Nintendo's copyrighted games.

BMUG

The fierce court battle featured dueling expert witnesses, with hackers (including BMUG buddy Steve Beck) and game hotdoggers on Galoob's side, and suit-'n'-tie sociologists on the other. When the smoke cleared, Judge Fern Smith's 40-page decision tossed Nintendo's arguments in the trash, and focused on the F-words—fair use and fixation.

She established that Game Genie is meant to be operated at home for fun and "private enjoyment," not in some commercial operation. Users have the right to screw around with their techno-toys in the family, living, or even bedroom. Martin Glick, lead trial counsel, told me that the decision was the most significant fair-use case since the famous Sony decision seven years ago. That was the case that lets us videotape television shows on our VCRs.

The judge also felt that since the product only changed the rules of Nintendo games, and couldn't write anything to the cartridge, there was no fixed derivative work. She wrote, "Such a process is analogous in purpose, if not in technology, to skipping portions of a book, learning to speed-read, fast-forwarding a video tape one has purchased in order to skip portions one chooses not to see, or using slow motion for the opposite reasons." Now I know who's checked out all the videos I want to see—Judge Fern!

Nintendo couldn't show any evidence that they were being harmed by sales of the Genie in Canada. A poll showed that users liked using their NES better with the Game Genie! Local game-meister Glenn Rubenstein confirmed this on the stand. The most ludicrous claim was that "Nintendo Culture" would be destroyed by the Galoob adaptor.

A couple of ivory-tower pencil-pushers maintained that there's a remarkable mindset created by Nintendo in its users. When kids get together to talk about games, compare high scores, and show off, they're indoctrinating themselves in this video game cult. One of Nintendo's witnesses stated that "high scores would not be indicative of any skill or achievement, and this socially reinforcing practice would fall to the wayside." Like growing up, maybe?

"Jimmy, your parents have some bad news for you. There's no Santa Claus, and your sister used Game Genie to beat your high score." Maybe it's time for Mom and Dad to get the kid a real computer. The Mac LC can run some really great games...

ALTERED WAIT STATES

Things didn't look so rosy at the original injunction hearing a year and a half ago. BMUG's collective knees shook when Judge Robert Schnacke said, "Although the matter is not entirely black and white, Nintendo will prevail... The right to make changes in the

Martin Glick, lead trial counsel, told me the Nintendo-Galoob decision was the most significant fair-use case since the famous Sony decision seven years ago. That was the case that lets us videotape television shows on our VCRs.

Copyright © 1991 by David Morgenstern. All rights reserved worldwide. *David Morgenstern is a Bay Area "MacNurturer" and BMUG member. David is DMORGENSTERN on MacNET, 72030, 1607 on CompuServe, and himself at (415)549-BMUG.*

game clearly belongs to Nintendo." So what? It's just legal business as usual in the computer industry, right? Why would BMUG freak out over an 8-bit entertainment system?

The arguments seem innocuous: It's Nintendo's game system, so only Nintendo can alter the behavior of its games. The NES is a simple kind of computer, and the games, stored in read-only form in cartridges, are its applications. Game Genie lets users temporarily alter the way these applications run on the computer. The judge said that, most likely, such alterations were illegal infringements of Nintendo's copyrights! Replace "Nintendo" with your own particular flavor of computer, or computer program, and you'll see what sent us looping.

The ruling attacked some key exemptions for computer use in the copyright law, Section 117 of Title 17, which has a number of specific exemptions for software. Your right to make a backup of software that you own comes from this section.

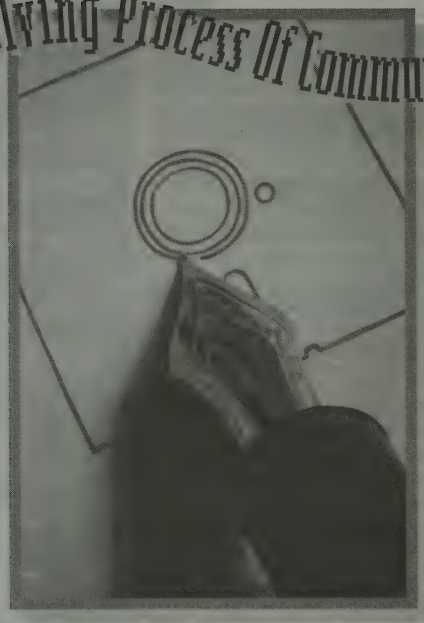
Nintendo pointed out that the program in a cartridge is one copyrightable work, and the audiovisual display shown when playing the game is another. The law recognizes this difference.

Two different computer programs that create identical audiovisual displays could, and probably have, been written—both should be copyrightable works. The flip-side, and the central argument in various look-and-feel cases, is that what's displayed on the screen is a copyrightable creative work, no matter what the mechanics behind it.

Users have always modified the programs they purchase. In the early days of computing this was done by the users/hackers/ aficionados themselves, but today almost all users use utility programs to alter others.

Based on this distinction, Nintendo's attorneys took a bizarre, but clever strategy. They argued that a user's right to adapt a computer program doesn't extend to any modification that would change the audiovisual display. Their reasoning was that the display is a copyrightable audiovisual work, so Section 117, which refers only to *computer programs,* simply doesn't apply. This is the old philosophy riddle: If a program operates in the woods, and is never displayed, was there any computation?

The Evolving Process Of Communication



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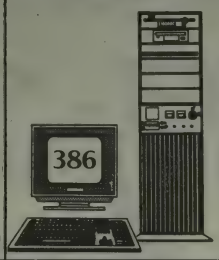

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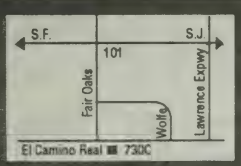

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BMUG BIKINI BRIEFS

BMUG decided that we had to do something about this frightening interpretation of the law. Whatever happens to a piece of software after it's purchased is the user's business, as long as the altered version isn't sold or distributed. This common-sense position was one we felt the court needed to hear.

The way we connect and interact with our computers is of vital concern to everyone, especially to a union of concerned and committed users. Although usually our brand of consumer advocacy is aimed at our members, this time we hoped to make a difference before things affected the general public.

So we got in touch with Ruth Herring, a San Francisco-based attorney with broad experience in computer licensing. She worked with Stephen Howard, who coordinated the BMUG braintrust, preparing an amicus (friend of the court) brief on a pro bono basis. BMUG thanks her for her hard work and effort.

Our brief pointed out that users have always modified the programs they purchase. In the early days of computing this was done by the users/hackers/aficionados themselves, but today almost all users use utility programs to alter others. We discussed many different commercial and publicly distributable programs that accomplish this task. They're familiar names to every computer user—Windows 3.0, Adobe Type Manager, and anti-viral software. Macintosh users would recognize the ResEdit and Layout utilities.

Nintendo also argued that third-party utility developers, like Galoob (the Genie was developed in England, and Galoob holds a license for it), would not have the right to sell software that would enable users to adapt their programs. They felt that computer users are capable of hacking the code themselves, and the Section 117 adaptation rights did not extend to commercial products. Good luck for any of us batting in the dark, trying to alter our programs without outside help.

Unfortunately, BMUG didn't hear about the case until after the usual time for filing an amicus brief, so we had to ask the Court for special permission to file—which they denied, even though we submitted it as quickly as possible. We did a bang-up job informing everyone of the real-world ramifications of the decision, and did the right thing, which is the BMUG way.

For all the sophistication of the hardware and software sitting on our desktops, we are still in the infancy of the Information Age. The future interfaces of man and machine are being decided by lawyers and judges applying legal principles filtered through experiences with older, more concrete media.

For all the differences that computer users have with the copyright laws, they will be the road we'll have to follow. Most countries around the globe have agreed to comply with certain basic copyright principles. Ruth Herring says that getting them all to agree on a separate computer-specific set of laws looks hopeless.

If you're interested in the issues and the case, one of the attorneys that won the case, Patricia Thayer of Howard Rice Nemerovski etc., will be speaking at the August BMUG West meeting.

THE MAX FACTOR

Sometimes a glorious event occurs that reaffirms one's faith in the innate stupidity of software developers. This happened with the shareware program MaxAppleZoom.

MaxAppleZoom is an Init CDEV that reprograms a standard Mac II video card to display a 704 x 512 pixel screen, instead of the normal 640 x 480. It only works with 4-bit and 8-bit Apple video cards. This phenomenal hack is by Naoto Horii of Belgium.

The program starts the monitor out at the smaller screen, and then gently intensifies the resolution of the video signal. Other monitors that aren't as adaptable as Apple's will just give a black screen to a MAZ-produced signal.

Suddenly last June, the product stopped working—everywhere. Horii had included a time bomb to bring everything to a MaxAppleStop. This paranoia code checked some information on the video board, which slot it was located in, and then calculated a date. Boom!

Moving the video board did make a difference. For each slot, the expiration date moved forward 12 days, 3 hours, 16 minutes, and 17 seconds (+/- 5 seconds). When the author refused to come forward with an updated version, all kinds of patches and fixes appeared.

Horii finally wrote a long apology on the networks complaining about System 7, and his heavy work schedule. He covered all the possible excuses by claiming his Mac's motherboard died. He hopes to get the corrected v1.4 out later in the summer.

Software eventually breaks and needs updating—it's a fact of computer life. Almost all Macintosh utility programs needed major work after the release of System 7. I have yet to receive an update notice for any of the packages that I own.

But some daredevils skate on silicon wafer-thin ice. A couple of foolish 4-D programmers wrote custom wide-screen applications that required MaxAppleZoom to operate. I could wax to the max on reliance on hacks.

SHAREWARE SPOTLIGHT

When Apple first introduced System 7 at the 1989 Developer's Conference, they showed something called the "New Print Architecture." A fantastic part of this Architecture was the concept of a Desktop

Continued on page 224

What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information, and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its ten thousand international members. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 pm (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, 2055 Center Street (a half block from the BART Station) is open to the public 9 am to 5 pm. Please come by and say hello, meet other members, and hang out.

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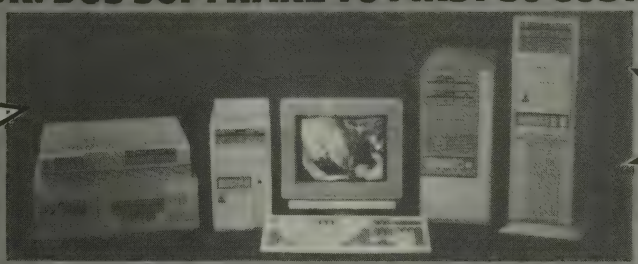

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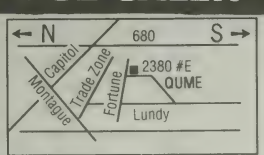

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HAM Animation

New Software Tools

BY MATTHEW LEEDS

AMIGA

Oxxi has just released a new HAM paint and animation program called SpectraColor, which bridges the gap between DigiPaint and DPaint III by offering animation and anim brushes.

The paint portion of the program should be familiar to anyone who has used Photon Paint. It offers a variety of complex blending patterns with dithering and shading, a pantograph tool for tracing shapes from one portion of the screen to another, control over on-screen shadow direction and distance definition, paint under selection, masking, brush wrapping around 3D objects, fonts effects such as drop shadows, 3D, and support for ColorFonts.

The animation side of the program owes a lot to DPaint III. It uses the same concept of anim brushes, except that these brushes are part of a HAM program. You can draw the animation path for a brush or specify the start and end points. You can even define two animation paths and toggle between them. Anim options include looping, ping-pong, delays, and hold frames. Brush objects can be stamped to the background to create trail effects.

SpectraColor can be run in as little as 512K, but I'd recommend at least 2MB for HAM animation. One nice touch is that you can load, play, and edit anims without decompressing them in memory, thereby increasing the number of frames you can use with a fixed amount of memory. The program offers support for severe overscan, runs fine with Kickstart 2.0, and lets you change the palette from frame to frame on the fly (useful for changing the sixteen base colors used in calculating HAM mode).

The manual that comes with the program is very well executed. Every feature is covered in detail, references in the back section cover theory of HAM mode and the anim file format, and a table of contents and index are included. Both the manual and a readme file on the program disk mention an installation program that does not exist, but installing the program just requires copying the program and two drawers of sample files. If you're looking for a HAM-only paint and animation program, this would be a good choice.

Another standout program that does an excellent job with HAM screens is Art Department Professional (ADPRO) from ASDG. They've released an upgrade to ADPRO, v1.0.3, free for all previous owners of the program, thereby demonstrating the excellent support for which ASDG is known.

ADPRO uses a modular approach that allows you to add new features by adding new modules—e.g., loaders (read a given file format), savers (write a given file format), and operators (perform an operation on an image). New features in this upgrade include a new loader which gives direct control over the PP&S FrameGrabber; a new saver which provides direct control over the Impulse FireCracker 24; new loaders that read MacPaint and HAM-E files; three new operators that offer blur, noise filter, and video tiling capability; and other useful features. As always, ASDG provides documentation that includes excellent support for AREXX.

AMIGA-VIDEO JOURNAL

As much as I appreciate your readership of this column, I've got to tell you about another source of information on Amiga video products.

A little over a year ago, Jim Plant started a small newsletter called *The Amiga-Video Journal* (Avid Publications). To be honest, I didn't expect it to succeed, although I did write a couple of articles for the first few issues (I no longer write for the publication). Not only has Jim been successful, but the *Amiga-Video Journal* has turned into an excellent source of information for anyone using their Amiga for anything related to video. He has attracted and kept a stable of well-known authors; he stays at the cutting edge of Amiga product development, and provides both a hacker's perspective and a professional's expertise. The last issue ran forty pages, filled with useful info, tutorials, reviews, and all the stuff folks on the front lines need to know. It's not slick, not color, but I definitely recommend it.

HUH?

Finally, as a student of human nature and a journalist, I've got to pass on to you a portion of an interview I read in a video trade publication. It's a classic example of talking out of two sides of one's mouth.

The publication is *Videography*, and the interview is with Dave Walton, JVC's Professional Products Marketing Manager. (This is from the May '91 issue in case you want to read the entire interview.)

Videography: *"What are the challenges to market JVC's line of economical special-effects generators in this era of Video Toasters and other PC-based effects systems?"*

Walton: *"There are a lot of veteran marketing people in the broadcast industry scratching their heads right now wondering how and why they (NewTek) could put out a product like the Video Toaster for $1595. I think that it is important to realize that the number of types of effects don't have anything to do with the overall quality of a video program.... A special effects generator is like a zoom lens on a home movie camera. In the hands of a pro, it is a valuable tool. But in the wrong hands, it can be one of the most annoying things ever invented. At $1595, I'm just afraid that too many of these things will wind up in the wrong hands.*

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Honest folks, that's what he said. Go figure.■

Copyright © 1991. All rights reserved. *Matthew Leeds has been involved in the high-tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.*

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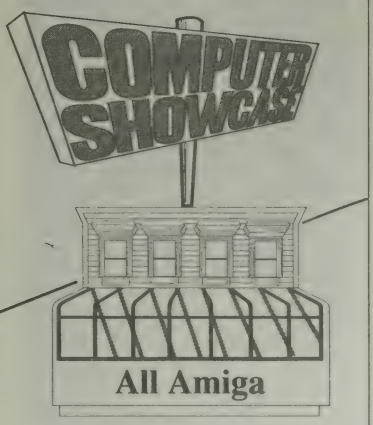

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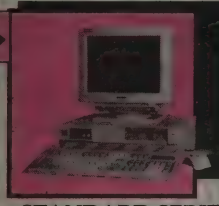

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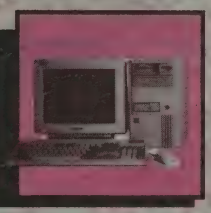

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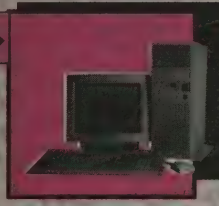

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RESOURCES

Calendar Of Events

AUGUST

August 4 Computer Show & Sale. S. San Francisco. MarketPro. Call: (415)388-8893.

August 4–8 The International Conference On APL. Stanford University. ACM & SIGAPL. Call: (415)326-7781.

August 7 Do You Need To Switch To DOS 5.0?—A Free Forum And Celebration Grand Opening. San Francisco. The Software Training Group. Call: (415)397-4158.

August 7–9 Time Line 4.0 Seminar. San Francisco. Symantec Training Group. Call: (415)898-1919.

August 7–November 20 Technical Writing Workshop. UC Berkeley Campus. Vista College. Call: Dr. C.J. Wallia, (415)841-8431.

August 19 Installing NetWare v2.2 For Consultants And Technicians Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 10 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 10 Computer Show & Sale. Alameda County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

August 10–11 User System Administration—Managing Your LAN, Level I Training Seminar. San Francisco. The Software Training Group. Call: (415)397-4158.

August 12 Automating Your Accounting System Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 12 Creative Computing TV Show. 10:30 pm, Channel 25 Viacom, San Francisco.

August 12 MORE Seminar: Outlining And Presentation Software For The Macintosh. San Francisco. Symantec Training Group. Call: (415)898-1919.

August 12 Wireless Networking And Novell NetWare Featuring Motorola's Altair 10MB Wireless Ethernet Network Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 12–14 Intro To C++ For C Programmers Course. Techmart. UC Extension. Call: (408)427-6636.

August 13–16 Optimizing/Customizing AutoCAD, Level I Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

August 13 & 20 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 14 Computer Show & Sale. Emeryville. MarketPro. Call: (415)388-8893.

August 14 Real Estate Management With Platinum Series Software Seminar. Sacramento. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

August 14 "What Does Windows 3.0 Offer?" Forum. San Francisco. The Software Training Group. Call: (415)397-4158.

August 15 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

August 15–16 Object-Oriented Design And Programming In C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 15–16 Q&A 4.0 Seminar: Database/Word Processing Software. San Francisco. Symantec Training Group. Call: (415)898-1919.

August 16 Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 16 Troubleshooting A Novell Network Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

AUGUST 18–21

OPENING WINDOWS TO SQL

San Francisco

The theme of the Second Annual International Gupta Developers Conference is "Opening Windows to SQL: From the Workgroup to the Enterprise." The conference includes four days of in-depth technical sessions, customer case studies, and panel discussions. Keynote speeches will be delivered by Umang Gupta, president and CEO of Gupta Technologies; James C. Bills of Novell; Tony Rego of IBM; and Herbert Edelstein of Euclid Associates. This conference will be divided into four tracks: Introductory Sessions on Technology; The Database and the Network; Foundations of Multiuser Applications; and a Special Events track including customer and third-party panel discussions. To register call: 1-800-672-2700.

August 16–18 FidoCon '91: The 1991 International BBSing And Electronic Communications Conference. Denver. Call: (303)426-1847.

August 17 Computer Show & Sale. Cow Palace. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

August 17 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 18 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

August 18–21 Second Annual International Gupta Developers Conference: Opening Windows To SQL—From The Workgroup To

Continued

OCTOBER 3–6

PACTECH '91: THE INTERNATIONAL PACIFIC RIM HIGH-TECH TRADE FORUM

Hong Kong

This international forum will examine the in's and out's of high-tech trade in the Pacific Rim, country by country, including the opportunities and challenges facing foreign manufacturers. An optional trade mission to Hangzhou, China will be held during October 7–10. Call: Info-Catalysts, Inc., 5201 Great America Pkwy., Suite 441, Santa Clara, CA 95054. (408)652-6399.

Calendar Of Events continued

The Enterprise. San Francisco. Gupta Technologies. Call: 1-800-672-2700.

August 19–21 C++ Programming For The Macintosh Course. Techmart. UC Extension. Call: (408)427-6636.

August 19–21 Disk Drive Technology Training Seminar. San Jose. Zadian Software. Call: (408)293-0800.

August 19–23 SCO Forum91: The International SCO Technology And Marketing Conference. Santa Cruz. SCO. Call: 1-800-553-9939.

August 20 AutoCAD Information Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

August 20 Discovering The Power Of Quattro Pro Seminar. Hyatt Palo Alto. Dun & Bradstreet. Call: (212)312-6880.

August 20 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 21 Discovering The Power Of Quattro Pro Seminar. Holiday Inn Union City. Dun & Bradstreet. Call: (212)312-6880.

August 21 Harvard Graphics Level 1 Class. San Francisco. PC Etcetera. Call: (415)291-8585.

August 21 Real Estate Management With Platinum Series Software Seminar. Stockton. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

August 21 "Software Toys": Presentation By Will Wright Of Maxis. Palo Alto. SEF. Call: Barbara Cass, (415)854-7219.

August 21–23 FoxPro 2.0 Training Seminar. UC Berkeley. CMB Software. Call: (415)465-7815.

August 22 Discovering The Power Of Quattro Pro Seminar. Walnut Creek. Dun & Bradstreet. Call: (212)312-6880.

August 22 Intro To SCSI Training Seminar. San Jose. Zadian Software. Call: (408)293-0800.

August 22 Quark Xpress I Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 22–23 MacApp Programming Using C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 23 Discovering The Power Of Quattro Pro Seminar. Sacramento. Dun & Bradstreet. Call: (212)312-6880.

August 23 Intro To Microsoft Works Database Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 23 Object Vision Level 1 Class. San Francisco. PC Etcetera. Call: (415)291-8585.

August 24 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 24 PC Workshop. San Francisco. SFPCUG. Call: (415)821-1310.

August 24–25 The PC Super Weekend: Hands-On Intro To DOS, WordPerfect, And Lotus 1-2-3 Seminar. San Francisco. The Software Training Group. Call: (415)397-4158.

August 26–27 AutoCAD Release II Update Training Class. San Francisco. SFSU Ex-

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Sun. Aug. 18 - SACRAMENTO
Scottish Rite Temple
Sat. Aug. 24 - VALLEJO
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Sun. Aug. 25 - HAYWARD
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Calendar Of Events continued

tended Education. Call: (415)338-1205.

August 26–28 SCSI: The Nuts And Bolts Training Seminar. San Jose. Zadian Software. Call: (408)293-0800.

August 27 Applying Quattro Pro Class. San Francisco. PC Etcetera. Call: (415)291-8585.

August 27–28 X-Window Systems Forum Management Conference. San Francisco. Digital Consulting. Call: (508)470-3880.

August 27–December 23 Design For General, Printing, And Desktop Publishing Class. Oakland. Laney College. Call: Bill Leal, Instructor, (415)464-3263.

August 27–December 23 Electronic Publishing Class. Oakland. Laney College. Call: Bill Leal, Instructor, (415)464-3263.

August 28 R:BASE Level 1 Class. San Francisco. PC Etcetera. Call: (415)291-8585.

August 28 Scanner Orientation Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 29 ATA/IDE Training Seminar. San Jose. Zadian Software. Call: (408)293-0800.

August 29 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 29 Quark Xpress II Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 31 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

SEPTEMBER

September 5–6 HD World '91 Conference: An In-depth Look At High Definition Systems For Film, Video, And Computer Graphics. San Francisco. HD Review. Call: 1-800-635-5537.

September 7 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

September 7 Computer Show & Sale. Santa Clara County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

September 9–10 Intro To Data Communications Class. San Francisco. PC Etcetera. Call: (415)291-8585.

September 11 Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

September 11–13 Time Line 4.0 Seminar. San Francisco. Symantec Training Group. Call: (415)898-1919.

September 14 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

September 15 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

September 16 MORE Seminar: Outlining And Presentation Software For The Macintosh. San Francisco. Symantec Training Group. Call: (415)898-1919.

September 16 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

September 16–17 Q&A 4.0 Seminar: Database/Word Processing Software. San Francisco. Symantec Training Group. Call: (415)898-1919.

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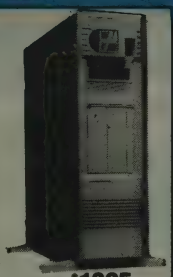

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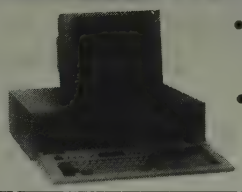

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4800 send Fax/ 2400 modem	$85 Int / $95 Ext.

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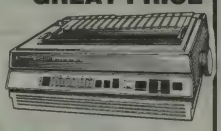

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KXP 1695 •330 CPS, 132 COL, 9-PIN	399

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LQ-860 ***NEW! COLOR version!***	589
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IBM 4019	150	200	250	300
Epson EPL-6000	150	200	250	300
Epson EPL-7000	N/A	100	150	200
Okidata 400/800	110	160	210	260
Brother HL-4	140	190	240	290

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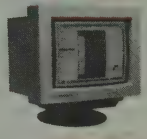

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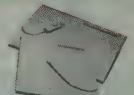

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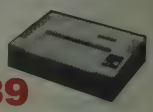

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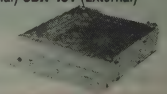

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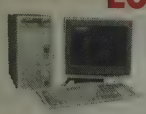

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September 22–25 Semi-Annual CIO Perspectives Executive Conference: IT And The Corporation—People, Productivity, And Profits. Monterey. *CIO Magazine.* Call: 1-800-366-0246.

September 23 Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

September 28 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

September 30 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

September 30 Networking With Windows Class. San Francisco. PC Etcetera. Call: (415)291-8585.

OCTOBER

October 1 Harvard Graphics Level 1 Class. San Francisco. PC Etcetera. Call: (415)291-8585.

October 3–4 Novell NetWare Seminar: An Intro To Networking PC's With Novell. San Francisco. Center for Advanced Professional Development. Call: (714)621-6277.

October 4 Agenda Database Class. San Francisco. PC Etcetera. Call: (415)291-8585.

October 6 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

October 7–11 INTEROP '91: Computers And Communications Coming Together Conference. San Jose. Interop, Inc. Call: (415)941-3399.

October 10 Networking With Windows Class. San Francisco. PC Etcetera. Call: (415)291-8585.

October 15 Real Estate Management With Platinum Series Software Seminar. San Francisco. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

October 15–18 TAPE: An International Conference On The Issues Of Technology, Aesthetics, Politics, Education, And Entertainment In The Multimedia Movement. San Rafael. Dominican College of San Rafael. Call: (415)485-3255.

October 16 Applying Quattro Pro Class. San Francisco. PC Etcetera. Call: (415)291-8585.

October 17 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

October 22 Real Estate Management With Platinum Series Software Seminar. San Jose. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

October 23 Intro To LANs Class. San Francisco. PC Etcetera. Call: (415)291-8585.

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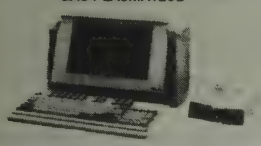

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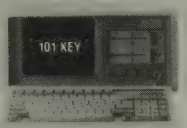

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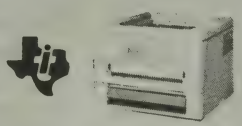

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Cruzio. (408)423-9995. 1200/2400. If 1200, send Ctrl-C on connect. Santa Cruz. Calendar, directory, USENET newsgroups, email, conferencing. Sysop: Chris Neklason & Peggy Dolgenos. [Exp. #86.]

The Cypress Express BBS. (408)423-3812. 1200/2400. Various message areas and assorted topics of interest for everyone. FidoNet 1:143/512. Sysop: Tom Fox. [Exp. #87.]

The Dark Side. (408)245-SPAM. 24 hrs. Free access to Usenet and UUCP mail. Since 1985. Internet: darkside.com. [Exp. #87.]

Data Port BBS. (408)259-3019. 1200/2400. 40+ door games, FidoNet mail networking, file transfers. Sysop: Ian Robertson. [Exp. #87.]

DC-to-Light. (408)262-5150. 8-N-1, 24 hrs., 300/1200/2400. MS-DOS, CAD, UNIX, WIN, LAN, & HAM: Conferences and email. Sysop: Fred Townsend. [Exp. #86.]

Digikron Systems BBS. (408)253-1309. 8-N-1, 1200/2400/9600. Extensive Macintosh & MS-DOS sections. Sysop: Doug. [Exp. #87.]

The Electronic Pages. (408)253-4280. 300/1200/2400. Commercial and private advertising, online ordering. Select by category or key word. Sysop: Contemporary Communications. [Exp. #86.]

The Fun Seekers BBS. (408)379-0958. 8-N-1, 24 hrs., 300/1200/2400. Easy access, IBM PC compatible, advertise doors, utils, games, etc. [Exp. #86.]

The Gay Seekers BBS. (408)379-0958. 8-N-1, 24 hrs., 300/1200/2400. Free access, safe haven for paranoids & schizophrenics. Sysop: Big Bruce. [Exp. #86.]

Grapevine BBS. (408)258-7551. 1200–19,200. Windows, PD shareware, GIFs, games, and more. Operated by Grapevine Computer Systems. Sysop: Chris Harris. [Exp. #86.]

HAM BBS. (408)267-6396. 300/1200/2400. IBM. Ham radio, Windows files. Sysop: Travis Wise. [Exp. #87.]

LOCALINK On Line. (408)244-8556, 244-8557. 8-N-1, 24 hrs., 300/1200/2400/9600. Get your business data online for public shopping/buying. Customized Business & Personal email/libraries/fax services. Sysop: Mark Sullivan. [Exp. #87.]

Lynn-Western Newswires. (408)778-5994 & 778-9656. 8-N-1, 24 hrs., 1200/2400. FidoNet 1:143/304. Professional information on technology, management, and worldwide investment news. Stock market data online. [Exp. #87.]

Magic Kingdom. (408)245-3961, 253-2426. 24 hrs., 300/1200. Multiline chat, email. San Jose and Sunnyvale. Voice: (408)947-6178. Sysop: Mike Hammer. [Exp. #86.]

Mail Stop. (408)257-1919. 8-N-1, 300/1200/2400. Free, private/corp email and graphic file exchange. Sysop: Unmonitored. [Exp. #86.]

The Micro Foundry Multiline BBS. (408)247-1717. 1200/2400/9600. 20,000+ files. PC-SIG CD-ROM library. [Exp. #85.]

Mongoose BBS. (408)733-3034. 24 hrs., 1200/14,000, V.42BIS. 23,000 files, 2.4GB. Sysop: Robert Yag. [Exp. #86.]

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ShrinkTank BBS. (408)257-8131. 8-N-1, 300/1200/2400 & 9600 for SuperModem users. Mental health, psychology, men's issues, Metrolink conferences. All users welcome! Sysop: Rob Bischoff, Ph.D. [Exp. #87.]

The Silicon Matchmaker. (408)492-9858. 24 hrs., 300/1200/2400. Electronic PenPal Network, 16 lines. [Exp. #87.]

SoftByte Windows Support Line. (408)739-8690. 8-N-1, 6 pm–6 am M–F, 24 hrs. weekends, 1200/2400/9600. [Exp. #87.]

Starnet Connections. (408)949-3133. 8-N-1, 24 hrs., 300/1200/2400/9600. Los Altos. Email, UseNet, UNIX, and more. Sysop: Richard Mahn. [Exp. #87.]

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Abacus BBS. (415)587-8062. 300/1200/2400. Atari Bay Area Computer Users Society (Abacus) for 8-bit and ST. [Exp. #85.]

The Abyss BBS. (415)482-5813. 24 hrs., 300/1200/2400. IBM/Mac/Amiga, file & msg. base, email, online games. Sysop: Keymaster [Exp. #86.]

AC Co-op BBS. (415)523-1268. 8-N-1, 2400. Public domain/shareware, msg. base, registration. Sysop: Doyle Dewberry. [Exp. #86.]

AIDS Info BBS. (415)626-1246. 8-N-1, 24 hrs., 1200/2400. 25MB dBASE with index, keyword search, online help instructions, no chat. Topics on AIDS including read/write discussions, articles, stats, resource contacts, and private email between users. Text only. Sysop: Ben Gardiner. [Exp. #87.]

Amiga Addicts Anonymous (Triple-A). (415)222-9416. 1200–14,400 V.42. Technical discussions. Sysop: Randy Spencer. [Exp. #85.]

Anatomically Correct BBS. (415)856-8425. 2400. Free, adults only, unique "chat." Sysop: Howeird. [Exp. #86.]

BayTalk BBS. (415)864-6430. 8-N-1, 24 hrs., 300/1200. The number one electronic source for text of legislation concerning people with disabilities and catalogs of products for people with visual impairments. [Exp. #87.]

BBS of San Francisco Apple Core. (415)563-8652. 24 hrs., 2400. Lots of fun, supports Apple II and GS computers. [Exp. #87.]

The Blue Dragon BBS. (415)965-1465. 24 hrs., 300/1200/2400 V.42bis. IBM/Mac/MIDI/D&D/doors/SIGs/SCUBA. Running WildCat! Sysop: Jeffery Hargiss. [Exp. #87.]

Blue Smoke BBS. (415)455-5587. 300/1200/2400. Adult SIGs, GIFs, program files, online games. Sysop: Timber Wolf. [Exp. #86.]

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The Classified BBS. (415)665-7918. 8-N-1, 24 hrs., 300/1200/2400. Free advertising, IBM files section, Wildcat BBS support, email. Sysop: John Suelen. [Exp. #87.]

Combat Arms BBS. (415)537-1777. E-7-1 or 8-N-1, 24 hrs., 300/1200/2400. Specializing in firearms, laws, aviation, math, science, and Fido ECHOs. Fee to download. Sysop: Richard Bash. [Exp. #87.]

Compool BBS. (415)948-8928. 1200/2400/9600. 2 nodes, 360MB, online games, downloads! Sysop: Andy Bajka. [Exp. #86.]

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Greatful Med BBS. (415)689-0347. 8-N-1, 24 hrs., 1200/2400. For health professionals and wannabes! Sysop: TC Durfesne. [Exp. #86.]

Hints BBS. (415)572-8219/573-5473. 1200/2400/9600. Business apps. & simulation, medicine, pets, astronomy. Novice & experienced welcome. Since 1985. Sysop: Ernest E. Hintz. [Exp. #85.]

HTG/Outreach BBS. (415)572-9594. 8-N-1, 24 hrs., 300/1200/2400. Gay/Lesbian/Bisexual/Transgender, security clearance info, calendar, Electronic GGBA Business Directory. Sysop: Sagittarius. [Exp. #86.]

IBBS West. (415)564-9998. 8-N-1, 24 hrs., 300/1200/2400/9600. IBM PC and compatibles, MNP V.32, 2 lines, email, San Francisco. Sysop: [Exp. #86.]

InfoGate BBS. (415)967-2356. 300/1200/2400. FidoNet/RBBS-Net Echomail, files, games, programming topics. Sysop: Ken Thomaston. [Exp. #87.]

The Interlude BBS. (415)458-4344. 8-N-1, 8:00 pm–2:00 am, Wed. to Sun. Matchmaking, singles, personal ads. Sysop: Ed Tausing. [Exp. #85.]

J & Ms Funhouse. (415)528-2223. 8-N-1, 300/1200/2400. Atari, Mac, GIFs, sounds, online games, and other. Sysop: Doc. J & Matt. [Exp. #86.]

Jobs-on-Line. (415)324-3780. 8-N-1, 300/1200/2400. A multiline electronic employment and business opportunity search service. Free. [Exp. #86.]

Just Say Yes! (415)922-2008. Freedom of Information. NIRVANAnet. Sysop: Dr. Strangelove. [Exp. #87.]

Keyhole BBS. (415)626-9419. 300/1200/2400. Alt. lifestyles, adult areas, reg. required. [Exp. #87.]

MacCircles BBS. (415)484-4412. 8-N-1, 24 hrs., 9600. Local and network messaging, files, netmail, email, 2 lines. All are welcome. Sysop: Patricia O'Conner. [Exp. #86.]

Match-Makers & Engineers Jobs-Resume Online. (415)687-EBBS. 8-N-1, 24 hrs., 300/1200/2400/9600. 350MB and 650MB of CD-ROM shareware. Sysop: EBBS. [Exp. #87.]

Is Your Listing Missing?

Free user group and association listings are limited to the group's name and a ten-word description, including the mailing address and contact phone number. They will be **deleted at six-month intervals** to ensure timeliness and accuracy of information. **Free BBS listings** are also limited to the board's name, sysop's name, and a ten-word description including parameters, baud rate, phone number, and registration fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.**

You can update or renew your listings at any time. If yours is missing, send us a new one! Send your listing information to: US Mail should go to: MicroTimes User Group, 3470 Buskirk Ave., Pleasant Hill, CA 94523. Faxes are welcome at (415)934-2417 or (213)467-5486.

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486-50/64C	$ 1501	$ 1669	$1864	$ 1886	$ 2081	$ 2427
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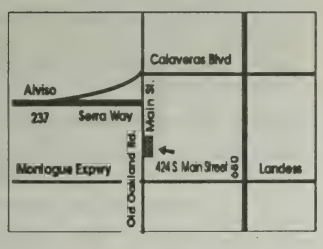

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Oinkers BBS. (415)490-5629. 8-N-1, 24 hrs., 300/1200/2400. Free digitizing of photos, free downloads/IBM Public Domain Software. Sysop: David F. Morgan. [Exp. #85.]

Pacific Shareware. (415)359-9319. 24 hrs., 300/1200/2400. 652MB, 12,000+ Zip files, shareware/freeware. [Exp. #85.]

PC Clubhouse User Group BBS. 8-N-1, 300/1200/2400. Castro Valley, (415)581-8529. San Leandro, (415)357-9577. [Exp. #87.]

Peninsular Bulletin Board. (415)571-9259. 24 hrs., 1200/2400/9600. 230MB storage for files, messages, and Echomail. Reg. required. Sysop: Bob Wallace. [Exp. #87.]

Rathead. (415)524-3649. Home of the PigDog Journal. NIRVANAnet. Sysop: Ratsnatcher. [Exp. #87.]

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Recovery BBS. (415)255-2188. 300–9600. AA, NA, Al-Anon/ACA, SLAA. Recovery and 12 Step Echos. Fido 125/9. Sysop: Rich Gorlin. [Exp. # 86.]

SF Net. (415)824-8747. Connecting SF coffee bars with the RJ11-Table. 16-line chat. Sysop: Wayne Gregori. [Exp. #87.]

Shrink-Rap. (415)344-8820. Nights only. 1200. Email, psychological and computer themes. Topical discussions encouraged. Sysop: Martin Schaaf, hypnotherapist. [Exp. #87.]

SportCenter BBS. (415)426-9630. 1200/2400. Specializing in sports discussion, news, and more. Expanding text file base. [Exp. #86.]

VA Listings. (415)744-7793. 24 hrs., 300/1200/2400. Multiline, VA-owned homes for sale. Sysop: David Piersall. [Exp. #85.]

Viper 1 Premium BBS. (415)535-0231. 8-N-1, 24 hrs., 2400/9600. Multiline, 70MB, 40 conference areas, online combat, online shopping. [Exp. #86.]

Wetware Diversions. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. Full Usenet news, 8 lines, San Francisco's Public Access UNIX System. Sysop: Eric Swason (editor@wet.UUCP). [Exp. #87.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software. Info., shareware, chat. Sysop: Bob Cram. [Exp. #87.]

Wishing Well. (415)745-7901. 24 hrs., 300/1200/2400. Email, matchmaker, files, 80+ online games, free access. [Exp. #86.]

707

The Darkside of the Moon BBS. (707)451-3323. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Multiline, email, 670MB IBM library, adult area, Professional Technology oriented. Sysop: Stephen Cannon. [Exp. #86.]

The Programmer's Hut. (707)795-1721. 24 hrs., 1200/2400. Oriented towards programming, source code, libraries, etc. Sysop: Ren Just. [Exp. #87.]

The UNIX Connection. (707)792-0420. 24 hrs., 1200/2400. UNIX oriented, but files for DOS, Mac, Amiga. 300+MB storage. Sysop: Ren Just. [Exp. #87.]

1-800

Computer Show Hotline. 1-800-464-6408. 8-N-1, 1200/2400. Latest Computer Show info. Complete list of dates, times, locations, and directions. [Exp. #86.]

PROFESSIONAL ASSOCIATIONS

Association for Women in Computing. Meetings: 1st Wed., 5:30 pm, San Francisco Marriott. Call: (415)979-8450. [Exp. #86.]

The Association for Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #88.]

Computer Professionals for Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, room 608-7. Call: Judy Stern, (415)643-7499. [Exp. #90.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #89.]

Independent Computer Consultants Association, Silicon Valley Chapter. Meetings: 4th Thurs., 6:00 pm. Meetings are open to all. Call: ICCA, (408)492-8888. [Exp. #90.]

Independent Computer Consultants Association. Meetings: 2nd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #86.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:15 pm, San Rafael. Call: Harry Chapman, (415)291-0174. [Exp. #87.]

Society for Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:00 pm, Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Call: Rich Julius, (415)837-0397. [Exp #90.]

Society for Technical Communications, East Bay Chapter. Meetings: 1st Thurs. Call: Corinne Stefanick, (415)769-8931. [Exp. #88.]

Society for Technical Communications, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #88.]

Society for Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #88.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #86.]

United Sysops Association. Meetings: 2nd Wed, 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (408)453-3321. [Exp. #88.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #85.]

Writer's Online Association of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #86.]

USER GROUPS

ACCOUNTING

Champion Accounting Systems User Group. Fremont. Newsletter, BBS, pub. dom. disks, info line. Call: Garhart, (415)657-5880. [Exp. #85.]

AMIGA

AAA (Amiga Addicts Anonymous). Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (415)935-0829. [Exp. #88.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Terminal. Call: Paul, (415)826-6053. [Exp. #88.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #85.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary. Call: (415)584-8406. [Exp. #87.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:00 pm, Palo Alto Hyatt. Call: Mike Fisher, (415)855-9426, BBS (415)595-2679. [Exp. #90.]

APL

APL Bay Area User Group. Meetings: 2nd Mon., 7:00 pm. Call: Tibor Horvath, (415)283-5611. [Exp. #90.]

APPLE

San Francisco Apple Core. Meetings: 3rd Tues., 7:00 pm, SF State University, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #88.]

APRICOT

Apricot User Group, East Bay Chapter. New members welcome. Call: Ron, (415)828-9643. [Exp. #85.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #90.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #90.]

AT&T Computer Users Group. Meetings: 2nd Wed., 6:30 pm. Refreshments, technical support, and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #90.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #90.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. Call: (415)469-7924. [Exp. #88.]

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #86.]

COAST User Group. Meetings: 3rd Wed., 1514 University Ave., Berkeley. Specializing in DTP, CAD, and serious use. Call: Bill Yerger, (415)548-8999, BBS (415)845-1789. [Exp. #85.]

Santa Clara County Atari Users Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computer Showroom, 1278 Alma Court. Formerly South County Atari Users Group. Call: Ron Reade, (408)225-7162, BBS (408)848-6032. [Exp. #88.]

CAD/CAM

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #86.]

Marin ACAD User Group. Meetings: 1st. Thurs. Call: Gigi Bollinger-Himes, (415)491-4722. [Exp. #86.]

S.F. AutoCAD User Group. Meetings: 1st Mon. Call: Mark Williamson (415)383-4060. [Exp. #89.]

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #86.]

Textile Computer Users Group—TCUG. Meetings: Bimonthly, 1st Sun., 10:00–noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #86.]

COMMODORE

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (415)793-2514. [Exp. #87.]

Cupertino Chapter of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #85.]

CWEST Commodore 64/128. Meetings: 3rd. Wed., 7:00 pm, Fort Mason. For info: 1564 Waller #B, San Francisco, 94117. Call: (415)626-9946. BBS, (415)626-9946. [Exp. #87.]

North Valley Chapter of 64/More Commodore User Group. Meetings: 2nd Sat, 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #85.]

dBASE

East Bay Database User Group. Guest speakers. Call: David Chilcott, (415)653-1303, BBS (415)652-1763. [Exp. #85.]

Silicon Valley Computer Society X-Base Language Group/dBASE SIG. Meetings: 1st Tues., 7:00 pm, Birchwood Systems, 2001 Gateway Pl., Suite 480 W., San Jose. Call: Fletcher Johnson (408)283-1333 (days & early evenings). [Exp. #90.]

Silicon Valley Computer Society X-Base Language Group/FoxPro SIG. Meetings: 2nd Thurs. 7:00 pm, Birchwood Systems, 2001 Gateway Pl., Suite 480 W., San Jose. Call: Fletcher Johnson (408)283-1333 (days & early evenings). [Exp. #90.]

DESKTOP PUBLISHING

Bay Area Desktop Publishing User Group. Meetings: 1st Tues., 7:00 pm, 2493 Telegraph Ave., Berkeley. Topics include approaches to learning DOS 5.0 and Windows 3.0. Call: (415)548-7712. [Exp. #90.]

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Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #86.]

FOURTH

Fourth Interest Group of North Bay. Meetings: 2nd Sat., 1–5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #87.]

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IBM AND COMPATIBLES

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Napa Valley PC User Group. Meetings: 2nd Wed., 7:30 pm, 10 Chapel Hill Dr., Napa. Call: Lee Schwab, (707)257-2675. [Exp. #85.]

PC Clubhouse. Meetings: 1st Fri., 8:00 pm, Meiklejohn Hall, CSU Hayward. Many SIGs. CV BBS: (415)581-8529. San Leandro BBS: (415)357-9577. Call: Roberta, (415)429-1007. [Exp. #87.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338, ext. 444. [Exp. #88.]

San Lorenzo User Group. Meetings: 2nd Tues. and the 20th, 7:00 pm, Gathering Place in Ben Loman, Santa Cruz County. Call:

Continued on page 224

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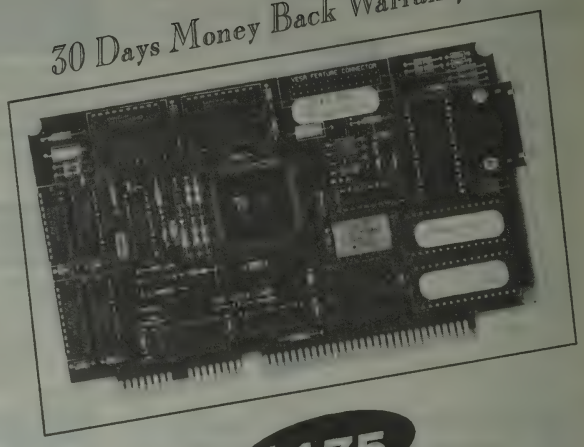

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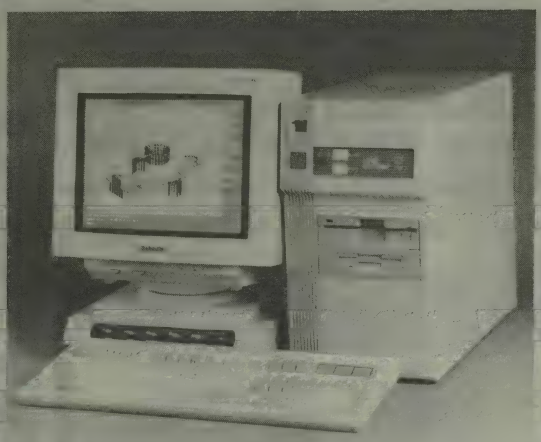

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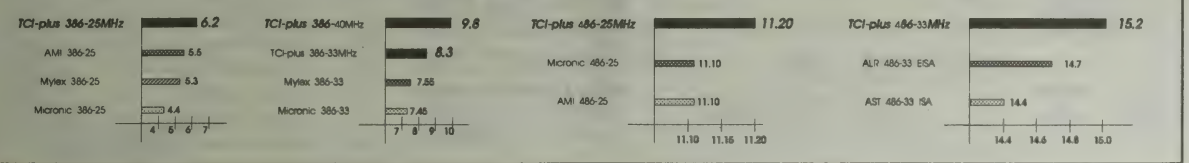

Continued from page 174

of up to 8:1, I could not detect any loss of image detail on my test file. In higher ratios, the picture began to lose detail, but it would still be useful in some applications.

All of these products need a batch mode that would let a user specify a set or folder full of files to compress, then take a coffee break while the software went to work.

Other vendors are entering the market with their own unique approaches to image compression. SuperMac Technology has licensed the C-Cube Compression Master hardware and will market it as the SuperSqueeze Still-Image Compression card. C-Cube produced the first single-chip image compression processor that implements the JPEG standard in silicon. By most reports it is fast enough to do motion video compression in real time. SuperMac has also announced a software implementation that will be provided with all of their graphic display cards. Plug-in modules will be provided for several graphics programs.

Not to be outdone, RasterOps has announced its own image compression board, called the ImagePak Compression board. It will offer support for 8- and 24-bit color and grayscale TIFF, PICT, and JPEG files. Ricoh has also announced its own software and hardware technology, called Generalized Chen Transform (GCT). They claim GCT is up to thirty times faster than JPEG implementations. I'll be taking a look at these and other products in a future article.

Waiting in the wings is another standard, the MPEG standard, designed for compressing motion video at ratios in excess of 100:1. Even with the use of the C-Cube chip, motion video cannot be run off of a CD-ROM in real time; MPEG may allow it to happen. Also, Intel's DVI may fall enough in price to become useful.

Apple's announcement of QuickTime will also add additional complications for Macintosh users trying to decide on a product suited to their needs. A careful evaluation of the current and coming technologies, and their impact, should precede any hardware purchase. ■

PicturePress supports an extension to JPEG, called JPEG++. This lets users compress different areas in the image at different ratios—a foreground object can be compressed at a lower ratio to maintain image quality, while the background is compressed at a higher ratio.

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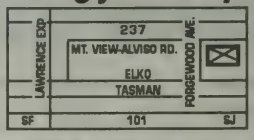

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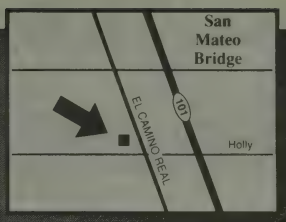

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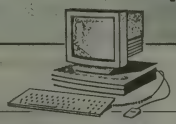

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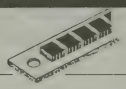

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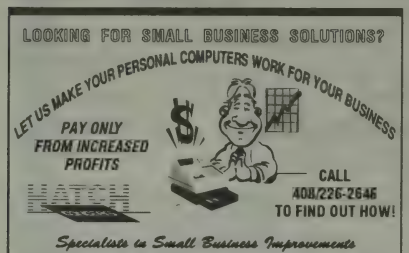
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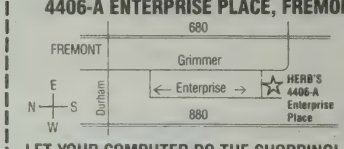

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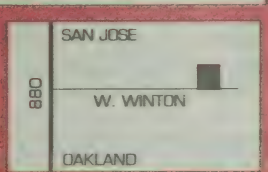

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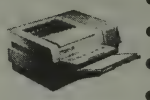

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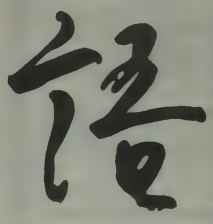

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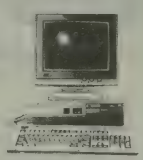

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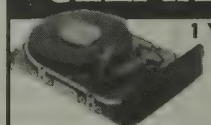

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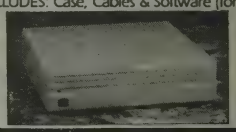

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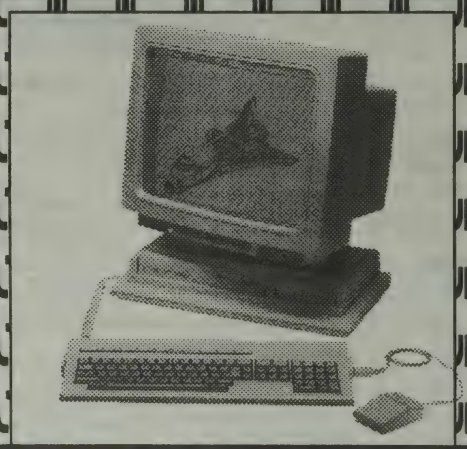

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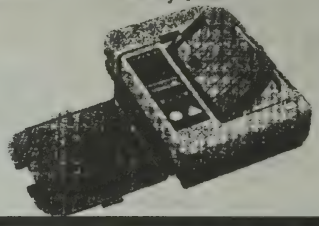

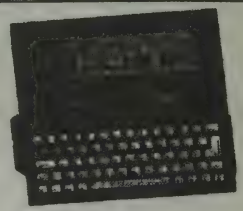

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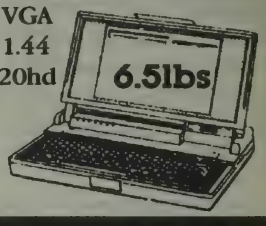

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SONY (with controller)
CDU 535-11 380ms SONY BUS int, hf ht . $459
CDU 7101 380ms SONY BUS ext, hf ht . 635
CDU 541-01 380ms True SCSI BUS int ht . 525
CDU 541-01 without controller 435
CDU 6211 380ms True SCSI BUS ext ht . 685
CDU 6211 without controller 575

5. CASES

XT Case / AT Case $30/50
Baby AT w/ 200W Power 105
Baby Tower w/ 200W Power 115
Mid Baby Tower w/ 200W Power 135
Tower AT w/ 230W Power 165
King Tower case w/ 375W Power 645
Hard Disk Drive External Casing
65W 69
2 half ht or 1 full ht, 60W, 11lbs 119
3 half ht or 2 full ht, 60W,
space for additional power, 13lbs . . 139

6. CONTROLLERS

4 Floppies controller $40
4 Floppies w/ IDE controller 49
IDE controller for XT, 8 bit 35
SCSI controller for AT 125
ADAPTEC
2322D 1:1 ESDI w/ kit 195
1542B SCSI w/ kit 299
DTC
6280 1:1 ESDI 135
7280 1:1 MFM 70
7287 1:1 RLL 79
DTK
Floppy Controller (XT) 18
Controller 1.2 & 1.44 (XT, AT) 35
IDE Controller DTK/Non-DTK 35/30
IDE w/ AT I/O (2 S,P,G) 59
FUTURE DOMAIN SCSI Controller
TMC 850 for XT (H only) . . . . . 79/139 kit
TMC 875 for XT (F & H) . . . . . 129/209 kit
TMC 860 for AT (H only) 119/139 DOS/189 kit
TMC 885 for AT (F & H) 139/169 DOS/259 kit
TMC 1660 for AT (H only) 159/199 DOS/289 kit
TMC 1680 for AT (F & H) 189/239 DOS/309 kit
ULTRASTOR
ULT 12F/32 32K ESDI cache 185
ULT 12C/1 1MB ESDI cache 565
WESTERN DIGITAL
Gen Card (XT) 55
1003V 2:1 MFM 85
1007A-WA2 ESDI 155

7. DIGITIZERS

Calcomp 23120 12"x12" 4 button $289
Seiko DT3613 12"x12" 4 button & pen 289
SummaSketch II 12"x12" 4 button & pen . . . 325

8. DRIVES

TEAC (Floppy Drives)
360K / 720K with frame $60/62
1.2MB 5.25" 65
1.44MB 3.5" w/ frame 65
CONNER (IDE)
CP-3000 40MB 25ms 3.5" 189
CP-3044 40MB 25ms 3.5" 219
CP-3104 100MB 25ms 3.5" 349
CP-30104 120MB 19ms 3.5" 369
CP-3204F 200MB 16ms 3.5" 599
MAXTOR
4170-170 167MB 14ms ESDI 5.25" full 799
4380-380 338MB 16ms ESDI 5.25" full 1105
4380S-380 338MB 16ms SCSI 5.25" full 1115
8760-760 676MB 16ms ESDI 5.25" full 1630
8760S-760 676MB 16ms SCSI 5.25" full 1720
LXT 213SY 200MB 15ms SCSI 3.5" 695
LXT 213A 213MB 15ms IDE 3.5" 619
MICROSCIENCE
HH1090 80MB 25ms MFM 5.25" half ht . . 325
NEC
D3142 40MB 28ms MFM 3.5" 265
D5655 150MB 18ms ESDI 5.25" half ht . 599
PLUS DEVELOPMENT (Hard Card)
Hardcard II 80 80MB, 19ms 499
Hardcard II XL 50 50MB, 9ms 389
Hardcard II XL 105 105MB, 9ms 575
SEAGATE
ST-225 20MB 65ms MFM 5.25" half ht . 190
ST-251-1 40MB,28ms,MFM,5.25",1/2 ht,kit . 245
ST-157A 40MB 28ms IDE 3.5" 189
ST-1102A 80MB 19ms IDE 3.5" 305
ST-1239A 211MB 15ms IDE 3.5" 599
ST-277N 64MB 28ms SCSI 5.25" half ht . 315
ST-296N 84MB 28ms SCSI 5.25" half ht . 335
SYSGEN
Easy Floppy for all AT 720K/1.44MB 90

9. EXTERNAL DRIVES

DELTAIC
SuperBaby w/ power & carrying case, 2.25lb
40MB 25ms / 117MB 19ms 555/785
SYSGEN
Portable EasyFloppy 3.5"/5.25" for laptop . . 235

10 I/O CARDS

DTK
Hexa I/O (XT : S,P,G,Clock,Cont) $40
Penta I/O (XT : S,P,G,Clock) 33
AT I/O (S,P,G) 32
Mini AT I/O (S,P) 29
AT I/O w/ IDE Controller 59
Serial Card (XT only) 17
Printer Card / Game Card (XT, AT) 17
EVEREX
Magic AT I/O 49
Magic AT I/O w/ Game port 57

11. KEYBOARDS

NORTHGATE OMNI
101NI / 102 / Ultra $69/71/95
Keyboard cover for 101 / 102 / Plus / Ultra . 15
OTHERS
KEYTRONIC 101 45
MAXI 101 40
MITSUMI 101 40
Wrist Pro (wrist support) 20

12. LAPTOPS

ACER
1120NX 386SX-20, 1MB, 1.44FD
VGA LCD backlit, DOS, 7 lb
40MB / 60MB HD $2575/2855
AST
386SX-20 Model 23V
2MB, 1.44FD, 20MB HD, DOS 3.3 . . 2445
CANON
BJ-10e (Bubble jet printer, 4.5lb) 319
See Printers Section #21
EVEREX
Tempo LX 386-16SX, 1MB, VGA LCD
1.44FD, 20MB HD, DOS 4.01, 7lb . . 2095
Tempo LX 386-20SX 40MB HD 2595
Tempo LX 386-20SX 60MB HD 2895
2MB card 395
Battery / Charger / Modem 125/95/275
MICRONICS
386-25, 4MB, 1.44FD, 40MB HD,
DOS 4.01& Windows 3.0 2795
PANASONIC
CF-150B Backlit LCD, 720K FD w/case . . . 595
Battery for CF-150B 29
CF-170 8086 Backlit LCD
1.44 FD, 20MB HD 1575
SAMSUNG
Notemaster 386SX-16 1MB, 1.44FD, 20MB HD
640x480 VGA display, Win 3.0 & Lap-Link 2095
TWINHEAD
386SX-20 1MB, 1.44FD, 40MB HD, LCD 2329
TOSHIBA
T1000SE / T1000XE 985/1195
T1200XE - 20 / 40 . . . . . 1875/2125
T1600X - 20 2235
2400 int modem 149
MEMORY for laptops
Compaq, Epson, Everex, Nec, Panasonic,
Sharp,Texas Instrument,Toshiba, Zenith
. . . . . call

13 LASER PRINTER ACCESSORIES

ADOBE . . . see Adobe in Software section #23
AVERY
Laser Printer Labels 1" x 2 5/8" 22
Laser Printer Labels for 5.25" diskettes 30
Laser Printer Labels for 3.5" diskettes 30
COMPUTER PERIPHERALS
Jet Page (for HP II) 295
Jet Memory 1MB (for HP IIP, III) 109
HP . . . see HP in Printer section #21
IQ ENGINEERING
Super Cartridge 1
for all HP Laser&True HP Compatibles 209
Super Cartridge 2 for HP II, IID, IIP, III, IIID 295
Super Cartridge 2 & 2LC 395
Super Cartridge 3 for HP III, IIID 275
Desk Jet 500 Std / Pro 115/145
Desk Jet Plus Std / Pro 105/145
Desk Jet 256K memory 115
PACIFIC DATA see top of next page
PANASONIC see Panasonic in section #21
MEMORY for Laser Printers
Apple, Canon, Epson, HP, IBM, Konica, Okidadta
Panasonic, QMS, Texas Instruments . . . . call

14. MEMORY CARDS

ACCULOGIC
up to 8MB(SIMM), 8/16 bit, for XT,AT $195
RAMpAT! up to 16MB(SIMM), 16 bit for AT 120
DTK 640K RAM Card (XT only) 29
EVEREX
XT 2MB, EMS $55
Ram 3000 Deluxe (AT 3MB, EMS) 84
Ram 8000 (AT 8MB, EMS) 165
Ram 10000 (AT 10MB, EMS) 125
Ram II 4000 (PS/2-5,6,7,80) 175
INTEL
Above Board w/ 512K 295
MEMORY for
Apple, AST, AT&T, Compaq, Dec, Dell, Epson
Everex, HP, IBM, Nec, Sun, Zenith . . . . . call

15. MODEMS & FAX

EVEREX
Evercom II (1200 Baud Internal) $48
Evercom 2400 Baud Internal 84
Evercom 2400 Baud Internal w/ MNP5 . . . 139
Evercom 9600 Baud Internal v.32 w/ MNP5 495
Evercom 2400 Baud External w/ MNP5 . . . 185
Fax Modem 2400/9600 Internal w/ MNP5 . 239
Pocket Modem for Laptop 2400 w/ MNP5 . 215
FRECOM
Fax 96 145
Fax 96 w/ 1 Liner & Far Fetch Fax 199
HAYES
9600 v.42 & x.25 BIS 525
Personal Modem 2400 165
SmartModem 2400B Internal/ External 245/385
INTEL
9600EX (9600 baud external modem) 489
SatisFaxtion card 305
VIVA (Computer Peripherals)
2400 Baud External for IBM / Mac 99/125
2400 Baud External w/ send fax 119
2400 Baud External w/ MNP5(for IBM/Mac) 139

16. MONITORS

ADI
14" VGA, 1024x768, .28 325
CORNERSTONE
Dual Page Display mono 1095
Dual Page Controller 725
HITACHI
CM2086MU 20", 1280x1024, .31, Non-Int 1795
MATSUSHITA
ViewPerfect 2 14" VGA, 640x480, .29 . . . 295
ViewSonic 4 14" , 1024x768, .29, Int 325
ViewSonic 5 14" , 1024x768, .25, Non-Int 545
MITSUBISHI (w/ base)
HL6605ATK 16", 1280x1024, Non-Int 995
HL6935ATK 20", 1280x1024, .31, Non-Int 1795
Cable 45
NANAO
9070U 16", 1024x768, .28, Non-Int 975
9080i 16", 1280x1024, .28 Non-Int 1355
NEC
2A 14", 800x600, .31 439
3D 14" Multisync, 1024x768, .28, Int 575
3DS 14", 1024x768, Int 585
4D 16", 1024x768, .28, Non-Int 995
5D 20", 1280x1024, .31 1995
Plus 14" Multisync, 1024x768, .31, Non-Int 555
PANASONIC
1381 14" Super VGA, 1024x768, .28 345
POWER II
3E 14" Super VGA, 1024x768, .28, Int . . . 305
4E 14"Multisync, 1024x768, .28, Non-Int . 359
QUME
835 14", 1024x768, .28, Int 335
SAMSUNG
MA2565 12" mono amber 75
MZ4571 14" mono paperwhite 115
ML4571 14" VGA mono 125
CJ4686 14" VGA, 640x480, .52 225
CT4581 14" EGA VGA, 800x600, .31 . . . 325
CVB4581 14", 1024x768, .31, Int 325
CVB4997 14", 1024x768, .28, Int,Non-glare345
CSA 7571 17", 1024x768, .31, Non-Int . . . 895
SEIKO
CM1450 14", 1024x768, .25, Non-Int 549
CM2050 20", 1024x768, .31, Non-Int . . . 1650
SONY
1304 14", 1024x768, .25, Non-Int 595
STANDARD TECHNOLOGIES
428UVGA 14", 1024x768, .28, Non-Int . . . 435
441 VGA 14", 800x600, .41 245
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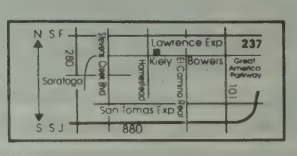

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(for HP III, IIID) 255
Font Bank (stores soft fonts) (NEW) 205
Headlines Cartridge
(for HP II, IID, IIP) 185
Pacific Outlines I / II (for HP III, IIID) 185

POSTSCRIPT Emulation
Pacific Page & 2MB (for HP II) 389
Pacific Page P.E. (for HP IID,IP,IIP,IIIP,IIIP) 325
Pacific Page XL (for HP IIP,IIP,IIID) 715
Pacific Page P.E. & Pacific Talk
for Mac & HP IID,IIP,IIP,IIID 450
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4MB 269
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2MB 149
4MB 239
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2MB 179
3.5MB 249
Pacific T Memory (for Epson 6000)
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Pacific Bar Code (for HP II) 315
Pacific Bar Code P.E. (for HP IID, IIP, IIP) ... 315
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Plotter in a Cartridge (for HP II) 225
Plotter in a Cartridge P.E.
(for HP IID, IIP, III, IIID) 225

17. MOTHERBOARDS

386SX-16 245
AMI
386-33M4/ 25M3 w/ 64Kcache 1095/975
486-25 128K cache, 4MB ISA 2695
486-25 64K cache EISA 2295
486-33 128K cache ISA/ 64K EISA 2395/2745
DTK
386SX -16 / 20 ..... 265/325
386-25 w/o cache 495
386-33 64K cache 745
VLSI
286-12 115
MICRONICS
386SX-20 Multi I/O w/ IDE on board 325
386-25 (no cache) BMP-ASIC 495
386-25 64K cache BCP-ASIC 665
386-33 64K cache ACP-ASIC
(2S 1P, IDE adapter on motherboard) 795
386-33 64K cache BCP-ASIC 725
486-25 64K cache EISA 1725
486-33 64K cache ISA/EISA 1445/1945
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4MB Piggy Back (to 8MB) 455
16MB Memory Card 150
32K 2-Way cache 55
387 Adaptor 65
BOIS Award / Phoenix (386) 60/pair
Keyboard Chip 30

18. MOUSE

APPOINT
MousePen Pro (portable) $69
LOGITECH
Catchword 79
Cordless Mouse 119
Dexxa serial mouse 27
First Mouse serial 59
Mouseman Serial / Bus 64/71
Scanman Plus / 256 ..... 139/275
Trackman Serial / Bus 80/85
Trackman Portable Serial 99
MICROSOFT
Ball Point Mouse (new) 119
Mouse Serial 200PPI 69
Mouse Serial / Bus 400PPI 89
MOUSE SYSTEMS
Omni Mouse II 29
PC Mouse III (optical) serial 69
PC Mouse III Bus w/ Power Panel (optical) .89
PC Trackball 49
The White Mouse w/ Power Panel 56

19. NETWORK

3COM
3C503 8 bit 199
5 packs (5 boards 1 manual) 799
3C503-TP 8 bit / 5 packs 269/1160
3C505 16 bit, 256K / 5 packs 579/2620
3C507 16 bit / 5 packs 289/1250
ANTISOFT
Lantastic AE-2 Ethernet starter kit 10Mbps ..469
Lantastic AE-2 Ethernet adapter 10Mbps .. 215
Lantastic AE-2 Ethernet 64K RAM upgrade .45
Lantastic AE-2 Ethernet boot ROM 45
Lantastic /AI software 69
HAYES
Ethermate 8 ethernet adapter 8 bit 109
WESTERN DIGITAL
Ethercard Plus Elite 8bit / 16 bit 145/185
Netware Boot Rom 34

20. POWER SUPPLIES

150W / 200W (XT) $45/55
200W for Baby AT & Tower 55
230W (AT) 58
230W for Tower 69
Leadman (UPS)
330W / 500W / 1200W (UPS) 199/399/999
Dakota PowerSave500 (200W UPS Internal) 129

21. PRINTERS

BP4040 2MB, 4ppm, 35 fonts 1575
CANON
BJ-10e w/ bag (Bubble jet)360 dpi,37K buf$319
Auto Sheet Feeder 79
Battery / Print Head Cartridge 45/22
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GSX 200 (9 pin) 165
GSX 130 / GSX 140 (24 pin) 249/265
Color Option for above printers 45
Auto Sheet Feeder for GSX 140 129
GSX 145 (24 pin, 132 column) 399
Color option for GSX 145 65
PN48 notebook printer, 1ppm, 2lb 360
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Laserscript 3MB,6ppm,35 fonts 1295
Laserscript LX 2.5MB,6ppm,35 fonts 1495
FUJITSU
DL 1100 mono / color 295/339
DL 4600 prints 5-part form, bar code
mono / color 995/1129
HEWLETT PACKARD (w/ toner)
Desk Jet 500 489
Laser Jet III / IIID / IIIP 1515/2495/1049
Accessories:
Envelope Cassette(15 envelopes) for III 69
Envelope Cassette for IIP 79
Envelope Feeder for IIID 295
HP Postscript Cartridge 495
Legal Tray for HP II & III 69
Lower Cassette for IIP 160
Paper Tray for IIP 69
Toner for HP II / IIP/ III/ IIIP .. 85/75/85/75
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35 typefaces, 400x400 Turbo Res .. 1155
PANASONIC
1180 /1123 / 1624 ..... 159/229/375
32K Buffer for above printers 65
Serial interface card 75
4420 Laser 829
1MB Memory Card 169
Developer KX-PDP2 95
Drum KX-PDM2 99
Envelope Tray KX-P431 59
Fonts Card 95
Legal Tray KX-P425 45
Toner KX-P451 39
4450i Laser 1175
1MB Memory Card 169
Developer KX-PDP1 95
Drum KX-PDM1 145
Envelope Tray KX-P430 59
Fonts Card 95
Legal Tray KX-P420 45
Toner KX-P450 35
4455 (Postscript) 1975
same as 4450i
QMS
QMS-PS 410 4ppm, 2MB, 45 Fonts 1875
1MB / 2MB / 4MB Memory ... 129/179/269
Envelope Tray 89
Legal / Letter Tray 69
Lower Paper Cassette 160
Toner 95
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QMS-PS 2210 / 2220 ..... call
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Hand scanners .... see Logitech in section #18

23. SOFTWARE

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Plus Pack for Mac / Windows 3.0 119
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Streamline for Windows 3.0 225
Type Align for Windows 3.0 59
Type Cartridge 1: Display Faces 215
Type Cartridge 2: Best Sellers 225
Type Manager for Mac / Windows 3.0 59
Type Set 1/2/3 for Mac / Win 3.0 .. 75/75/105
MICROSOFT
DOS 3.3 / 4.01 ..... 65/49
DOS 5.0 (new) 65
DOS 4.01 w/ Windows 3.0 119
Entertainment Pack for Windows 3.0 35
Excel for Windows 3.0 / Mac 299
Flight Simulator 39
Maxx Control Yoke / Pedals (IBM) . 57/39
Maxx Instrument Flight Training 86
Learning DOS 35
Microsoft C 6.0 309
Microsoft C Compiler & software dev. kit .. 465
Mouse w/ Paintbrush 99
Mouse w/ Windows 3.0 157
Office 1.5(Excel, Word, Power Point, Mail) 455
Office for Mac 515
OS/2 Presentation Manager Tool Kit 1.21 . 309
PC Mail Server for DOS & Windows 435
Power Point for Windows / Mac 279/259
Productivity Pack for Windows 38
Project Management 4.0 309
Project for Windows 1.0 425
Quick Basic 4.5 62
Quick C Compiler w/ Quick Assembler ... 125
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Object Vision for Windows 99
Paradox 3.5 463
Quattro Pro 3.0 295
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Turbo Debugger & Tools 2.0 105
Turbo Pascal for Windwos 159
Turbo Pascal Professional 6.0 199
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PC Tools 7.0 w/ Anti-Virus 109
Corel Draw 2.0 349
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Algebra/ Read/ SAT/ Spelling . 30 & under
dBASE IV 1.1 445
Definition Plus! (American Heritage Dict.) .. 60
Fastback Plus 112
Geoworks Ensemble 129
Grammatik IV 2.0 57
Grammatik IV for Windows 57
hDC Windows Express 55
HP New Wave 3.0 109
Hardvard Graphics 3.0 395
Individual (Learning Software) .... 39 & under
Labels Unlimited 3.0 57
LapLink Rel 3 89
Lotus 1-2-3 Rel 3.1 379
MacPrint 85
More Fonts 79
Multimate 4.0 249
Norton Commander 3.0 84
Norton Utility 6.0 112
PFS: First Choice (w/ Prodigy start-up kit) .. 79
Pacioli 2000 24
PageMaker for Windows 4.0 469
Personal Lawyer/ Lifestyles 55
Pro-scan (virus identifier & remover) 55
Quarterdeck DesqView 286/386 v2.3 . 79/125
Qemm 386 v5.1 /Manifest /Qram 64/45/45
Quicken for IBM/Mac 39
Software Source (Public Domain) 3
Sound Blaster 145
CMS Chip / Speaker / MIDI kit .. 29/29/59
Ventura Publisher Gold for Windows 485
XTree Gold 2.0 95

24. TAPE BACKUP

AT & T
40MB $169
COLORADO
DJ-10 (40,60,120MB) 245
DJ-20 (250MB) 329
AB-10 Controller for DJ-10 75
FC-10 Controller 95
CK-17 Cable 20/9
KE-09 Ext kit w/o controller 75
KE-10 Ext Hardware kit for PC, XT, AT 119
EVEREX
(with software, cassette/cartridge)
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250MB (DC6250)/ Ext 757/865
60MB-PS/2 (DC600A) 704
60MB AT Floppy w/o media 225
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25. VGA CARDS

All VGA cards come 1024x768
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Wonder Plus w/ mouse 512K/1MB ... 209/229
8514 Ultra 512K 395
ATI chipset 256K/512K 95/115
DIAMOND Speedstar Plus 1MB 199
DTK Monographic w/ Printer $32
EVEREX
EGA Card 59
Viewpoint Standard (800x600) 75
Viewpoint NI 256K/512K 129/149
VRAM (1MB DRAM) 235
GENOA
6300 256K/ 6400 512K 95/115
6400A 512K 189
HERCULES
Graphics Station 1MB / 3MB 625/899
upgrade 2MB (to total 3MB) 335
ORCHID Prodesigner IIs 1MB 245
PARADISE
1024 256K/512K 129/149
8514/A Plus 449
512K memory upgrade (to total 1MB) . 205
Paradise chipset 256K/512K 79/99
PHOTON
Ultima Turbo (1280x820, 1024x1024) 325
VIDEO SEVEN
1024i 256K/512K 165/185
SPEA 1280 (1280x1024) 1895
VRAM 512K 365
VRAM II 512K 365
upgrade to 1MB 165

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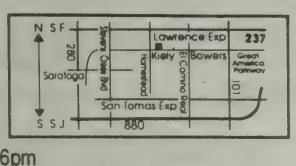

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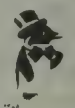

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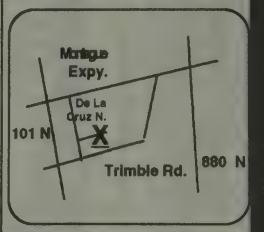

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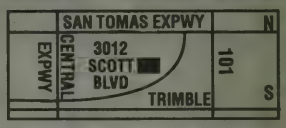

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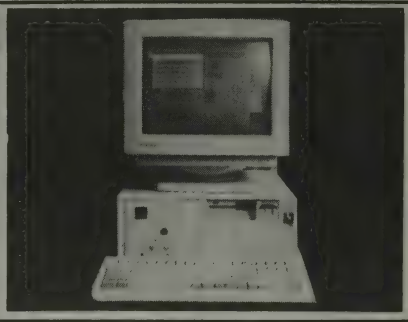

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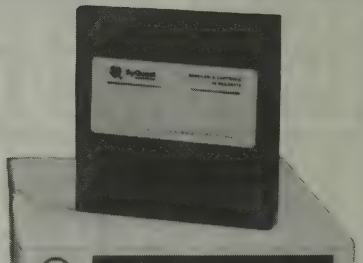

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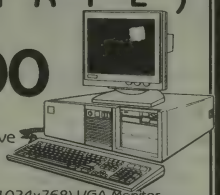

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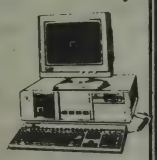

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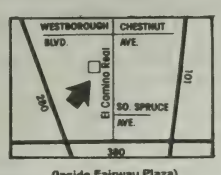

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LM Systems & Software
P.O.B. 1606 Union City, CA 94587.

SOFTWARE

Multiscope debugger windows/DOS shrinkwrapped list $380 programmer's warehouse $300 for you $200 (415) 835-0179

Amiga Games non-PD. Disk 1 $5. DF, Box 720542, San Jose, CA 95172-0542.

RJS Software Co. Featuring; RMA-BOSS (c). A complete network ready, orders in process system. Shipping reports, customer summaries. Mouse optional Rich Spector (408) 288-5962.

Amiga PD software: complete Fish Disk collection $1/disk. Call Mike (415) 424-8273 eves (415) 853-6507 days

SOFTWARE WANTED

Futurenet 4.XC, without possibility to upgrade. Documentation not necessary Mihai, (408) 249-5990.

CREATIVE TOOLS

Continued from page 184

Printer, which allowed users to have an icon on their desktop which represented a particular printer. You could then drag a document onto the particular printer icon, and it would print. This is a very useful feature when you have multiple LaserWriters, a Fax Modem, and Print to Disk utilities competing for your document's attention.

Desktop Printers didn't make the cut into the first release of System 7, but you can have them now thanks to BMUGer Leonard Rosenthol, who programs for Software Ventures. It's called DTPrinter, and is on BMUG Utilities A1 disk, available for $4 from the BMUG Office. ■

UPCOMING EVENTS:

August 15	Sitka New Product; SuperMac PixelPaint Professional.
August 22	Softways Mr. File; Intuit Quicken.
August 26	BMUG West at Exploratorium Museum, San Francisco. Hewlett-Packard, printers and scanners; Patricia Thayer on Computer Law.
August 29	Aladdin StuffIt Deluxe; Shana Informed Designer.
September 5	Slide Factory imaging service bureau, Total Systems.
September 12	Claris HyperCard 2.1; Delta Tao new graphics software.
September 19	Thunderware new product; MacVonk USA KeyPlan.

• Your Expanding Infosphere radio show, Saturdays at noon, KALW-FM 91.7, has BMUG meeting announcements. Check it out!

USER GROUPS

Continued from page 202

Chuck Schafer, (408)338-7348, BBS (408)335-4672. [Exp. # 86.]

KNOWLEDGE-MAN

Bay Area KnowledgeMan (and Guru) User Group. Meetings: 1st Tues, 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (415)947-4878. [Exp. #89.]

MACINTOSH

The International Macintosh SIG of the Stanford Macintosh User Group. Meetings: 3rd Thurs., 7:00 pm, Call: Schiko Berry, (408)826-7724, weekdays. [Exp. #90.]

MacSEF. Meetings: 3rd Tues., 7:00 pm, Call: Tony Meadow, (415)644-9400. [Exp. #86.]

North Coast Mac Users Group. Meetings: 3rd Thurs., 7:30 pm. Lark 2004, Santa Rosa Jr. College. SIGs on development, programming, and multimedia authoring, networking, graphics, and more. Call: Reed Hopkins, (707)542-1089, BBS (707)792-1871. [Exp. #85.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers User Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #88.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #88.]

MULTIMEDIA

The International Interactive Computer Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #88.]

MUSIC

Computer Music SIG. MIDI and beyond. All computer types welcome. Call: Bob Brander, (415)592-6993. [Exp. #86.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #87.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #88.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. [Exp. #87.]

NOVELL

The East Bay Novell Users Group. Call: George M. Gold, (415)444-4899. [Exp. #86.]

Sacramento NetWare User Group. Call: Charles Raley, (916)752-9561. [Exp. #89.]

The San Francisco Novell Users Group. Call: Thomas Thibault, (415)944-9500. [Exp. #86.]

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)453-3321. BBA (408)453-3326. [Exp. #86.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers at all levels. Call: Robert Smiley, (415)957-4656. [Exp. #87.]

PROGRAMMING LANGUAGES

Silicon Valley Computer Society C Programming SIG. Meetings: 3rd Mon., 7:00 pm, Doubletree Hotel, 5101 Great America Pkwy., Santa Clara. Discuss C related issues and occasional speakers. Call: Fletcher Johnson, (408)283-1333 (days & early evenings). [Exp. #90.]

RACES

California Races Group. Meetings: Tues., 7:00 pm, 1491 River Park Dr., Sacramento. Technical discussions on computerized emergency communications. Call: Jim West, (916)991-5505. [Exp. #87.]

R:BASE

R:Base Users Group of Oakland. Meetings: 2nd Thurs. Call: Longwell Assoc., (415)451-5316. [Exp. #87.]

SQL

SQL_Forum/Bay Area SQL Database Server User Group. Meetings: Once a month in downtown SF. Oracle, SQL Server, SQLBase, and more. Call: Robert Gentry, DBBS, Inc. (415)583-3000. [Exp. #90.]

UNIX/XENIX

UNIX SIG. Meetings: 2nd Tues., Oracle Corp. Fitness Center, Redwood Shores. Sponsored by Software Entrepreneurs Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #85.]

UNIX/XENIX User Group of N. CA. Write: Just Computers, PO Box 355, Cotati, CA 94931, Attn: User Group. Call: BBS, (707)792-0420. [Exp. #90.]

WORDPERFECT

South Bay WordPerfect User Group. Meetings: Saratoga Community Library. Dates vary, free. Call: Martin Van Derpool. (408)238-8434. [Exp. #85.]

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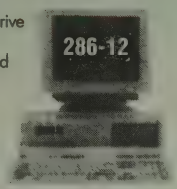

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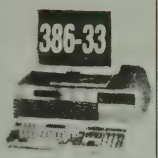

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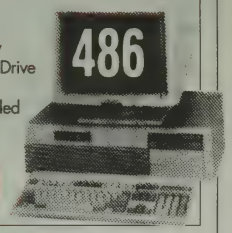

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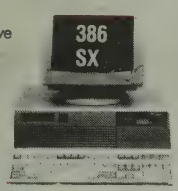

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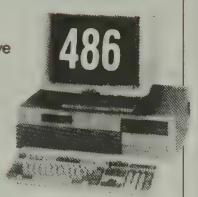
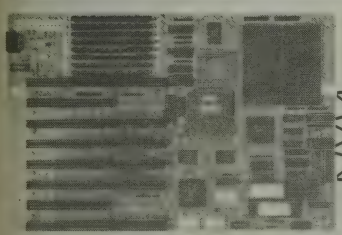


$2349

486-25 /33 Board Special



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486-33 board $475
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CITIZEN 200 GX	169
MOUSE w/WINDOWS	89
MODEM 2400	69
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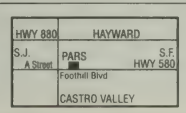

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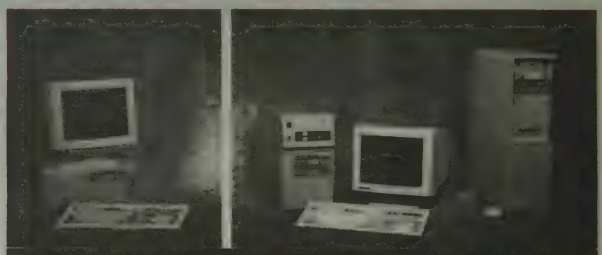
- 1:1 HDD/FDD controller
- 2 serial/1 parallel ports
- 101Enhanced keyboard
- Desktop case w/ PS

SYSTEMS: Prices below do not include Hard disk drive, monitor / card

486-33 EISA w/64k Cache	$1,898
486-33 ISA w/64k Cache (MCI/Symphony)	$1,198
486-33 ISA w/64k Cache (Opti™ Chipset)	$1,118
386-40 w/64k Cache	$828
386-33 w/64k Cache (Ti /Symphony™)	$768
386-33 w/64k Cache (C & T™ Chipset)	$668
386-25 (ECS - NEAT™ Chipset)	$588
386-25 (Opti™ Chipset)	$548
386-SX20	$448
386-SX16	$428
286-25	$398
286-16	$358
286-12	$328



Monthly Specials!!

MICRO-L 486-33AT Cache $2,495

- Basic System Plus: (Opti)
- Total of 4MB on-board
- 14" Sony 1304 SVGA Monitor
- Orchid ProDesigner IIs VGA card w/1MB
- 120MB 19ms IDE HDD
- Full tower case w/230W PS/ 7-bays

MICRO-L 386-33 Cache $1,645

- Basic System Plus: (C & T)
- Total of 4MB on-board
- 14" SVGA Monitor - Relisys RE-9514 w/16-bit SVGA card
- 105MB 17ms IDE HDD
- Full tower case w/230W PS/ 7-bays

MICRO-L 386-25 $1,295

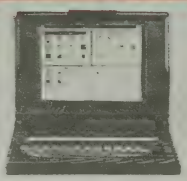
- Basic System Plus: (Opti)
- Total of 4MB on-board
- 14" SVGA Monitor - Relisys RE-9514 w/16-bit SVGA card
- 52MB 17ms IDE HDD

MICRO-L 386-SX 20 $1,055

- Basic System Plus:
- Total of 2MB on-board
- 14" VGA Monitor - Relisys RE-9513 w/16-bit VGA card
- 52MB 17ms IDE HDD

MICRO-L Special! 386SX-V16 / 386SX-V20 Notebook $1,950 $1,995

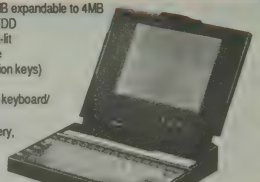
- Intel 80386SX-16/20 w/80387SX sckt
- 1MB exp. to 3MB/ 5MB
- 40MB HDD and 1.44MB FDD
- 14" LCD VGA CCFT Back-lit (640 x 480), 32 Grey scale
- Display area - 7.56" x 5.67"
- Int. 2400bps modem - MNP 5 Hayes compatible/1 P / 1S port / Ext. VGA port/ Exp. slot for LAN or battery power /5.25" & 3.5" FDD connectors
- Super low-profile 86 key keyboard (12 function keys)
- 101 key keyboard
- Removeable (NiCad) battery - 2Hrs. operating life, recharges in 2.5 hrs from unit or AC adapter



- AC adaptor (90-250V)
- Dim: 12.2" x 10" x 1.7" (W x D x H)
- Wt: 6.2 lbs (incl HDD, FDD/ battery)
- Optional 2MB memory kit - add $230

MICRO-L Special! 386SX-T16 Notebook $1,950

- Intel 80386SX-16 • 2MB expandable to 4MB
- 20MB HDD and 1.44MB FDD
- 14" LCD VGA CCFT Back-lit (640 x 480), 16 Grey scale
- 85/85 key keybd (12 function keys)
- 1 parallel & 1 serial port
- Ext. VGA monitor/101 key keyboard/ 5.25" & 3.5" FDD conn.
- Removeable (NiCad) battery, AC adaptor (90-260V)
- Dim: (W x D x H) 11.0" x 8.5" x 1.98"
- Wt: 6.3 Lbs (incl HDD, FDD/ battery)



MAIN MATERIAL VENDOR LIST

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Motherboard: TOSHIBA	Keyboard: ALPS	FDD: Matsushita
LCD: EPSON	Battery: SANYO	USA
	Inverter: EPSON	HDD: CONNER

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- 80386SX-16 Intel icroprocessor • AMI BIOS
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- One 3.5" FDD & one 40MB HDD
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- Ext. video (VGA) connector
- Internal modem slot
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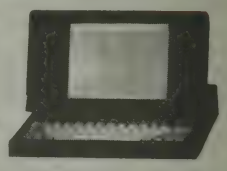
- Extra battery pack: add $75
- Int. FAX Modem Send: add $175



MOTHERBOARDS

486-33 EISA w/64K Cache/ to 64MB	$1,675
486-33 AT w/64K Cache/ to 16MB - MCI	$965
486-33 AT w/64K Cache Opti	$865
386-40 w/64K Cache w/CPU - AMD	$640
386-33 w/64K Cache w/CPU- TI to 64MB	$540
[illegible]	$460
[illegible]	$440
[illegible]	$395
[illegible]	$335
[illegible]	$295
[illegible]	$195
[illegible]	$185
286-12 VLSI	$105

HARD DRIVES

Maxtor XT-7080A 81MB IDE	$290
Maxtor LXT-213A 213MB IDE	$620
Maxtor XT-4[illegible] 338MB	$735
Maxtor XT-4380E/S 338MB	$1040
Maxtor XT-8[illegible] 760MB	$1060
Maxtor XT-8760S 760MB	$1495
Maxtor XT-8760S 760MB	$1515
Conner CP-30104 120MB	$360
Conner CP-3204 200MB	$563
Quantum LPS52A 52MB 17ms 1"	$215
Quantum ProDr80A 84MB,19ms,3.5"	$320
Quantum ProDr105AT 105MB,17ms	$340
Quantum ProDr210A/S 210MB,14ms	$635
Western Digital 93044 40MB IDE	$162
Ultrastor 12F ESDI Cntlr w/32K Cache	$100

Adaptec 1542B-Bd. SCSI Cntlr FD/HD	$275

MONITORS

Relisys VGA RE-9513 640 x 480	$290
Relisys VGA RE-9514 1024 x 768 0.28dp	$305
Relisys VGA Grey Scl RE-9503	$129
Relisys VGA 1024x768 RE-1420	$325
Seiko VGA 1024x768 CM-1440	$475
Seiko VGA 1024x768 CM-1450	$570
Seiko 20" VGA 1280x1024 CM-2059	$1745
Sony VGA 1024x768 1304	$590
NEC 3-D Multi-Sync 1024 X 768	$565
Nanao 16" VGA 1024x768 9070-U	$935
Nanao 16" VGA 1024x768 9080-I	$1195
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Genoa VGA Card 256K/512k	$75/95
Oak VGA 16-bit, 256K-840x600	$50
SpeedStar Plus VGA 1MB	$178
Orchid ProDesigner IIs 1MB (with system purchase)	$178
12/14" Mono w/mon. w/MGP card	$87/107

HP JETRAM

JetRam [illegible]	210

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Panasonic KXP-1[illegible]	155
Panasonic KXP-1123 24-pin, 192cps	$239
Panasonic KXP-1124i 24-pin 240cps	$285
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Colorado DJ-20 T-Back-up 250MB	$320
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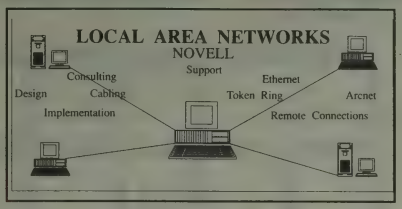

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Fully compatible wit DOS, Windows 3.0, CAD, Unix, OS2, Network

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386/33 64 K Cache $675

- 1MB RAM Landmark 56
- 1.2MB FD
- 2S/1P/1G port
- Enhanced Case & Power Supply
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- 386/25 $545
- 386/sx 20 $485
- 386/sx 16 $435

286/12 $499

- 1Mb RAM
- Enhanced Case and Power Supply
- 2S/1P/1G port
- Clock, Calender/Back-up Bat
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- MOUSE

286/16 $519

1. VGA

a. Super VGA 14" Monitor /card 1024 x 768 .28 Dot Pitch	$359
b. Regular VGA 640 x 480 .39 dp 14" Monitor & 16 bit card	$295
c. Regular VGA 640 x 480 .51 dp 14" Monitor & 16 bit card	$265

2. Non Interlace Monitor

a. Procision Plus 1024 x 768 .28 dp 14"	$395
b. Relysis 15" 1024 x 768 .31dp 15"	$425
c. Seiko 1450 1024 x 768 .25 dp	$595
d. Sony 1304 1024 x 768 .25 dp	$595
e. Samsong 17" 1024 x 768 .31 dp	$825
f. NEC 4D	$995
g. Mono 14"	$ 95
h. Nanoa 916 1024 x 768	$1159

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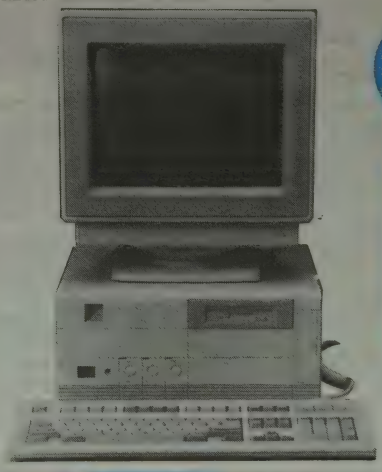

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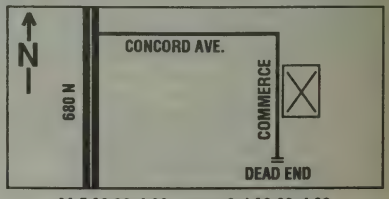

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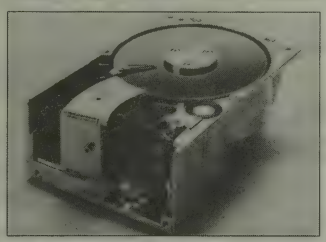

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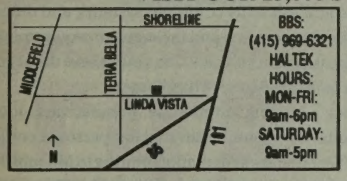

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Was It Automatic Writing? Or Did My Spell Checker Do This?

Here's The News From 1998

BY JOHN C. DVORAK

I was playing around with my new spell checker and must have done something wrong.

I get this news briefing compiled from Online Today, AP, UPI, and other sources, and to test the system I ran a recent download through my spell checker—which rewrote all the stories and changed all the dates. I didn't realize it at the time but the spell checker had a copyright date of 1998!!

I found the whole thing to be suspicious, but this is apparently the news from 1998.

SOFTWARE PUBLISHING TO OFFER APPLICATIONS FOR VOICE SYSTEMS

Software Publishing Corp. plans to develop application software for GO BROKE Computer's voice-based operating system.

Chief technical officer Ed Esber said in a statement from his Mountain View, CA., offices: "Software Publishing believes that voice computing is ideally suited for people who haven't been able to use computers in the past."

DVORAK'S LAST COLUMN

He added the firm chose GO BROKE Computer's Shouting Match operating system because of its efficient use of memory and its "real cool name."

NOVELL TO ACQUIRE MICROSOFT

Novell Inc., the Provo, Utah, creator of network operating systems, has signed a definitive merger agreement with Microsoft, the once-successful developer of advanced operating systems. After a nasty FTC investigation, a lawsuit won by Apple Computer, and the subsequent retirement of Bill Gates (who earlier cashed out and bought Boeing, Lockheed, IBM, most of British Columbia, and the entire city of Butte, Montana, thus reducing his fortune to $40 billion), the company fell on hard times. Most of the stock is now owned by the former Microsoft PR agency.

After the deal is completed, Microsoft, headquartered in Portland, Oregon, will be operated as a wholly owned Novell subsidiary. Under the terms of the agreement, signed yesterday, existing shares of Microsoft common stock, convertible securities, and options will be exchanged for $500 of newly issued shares of Novell common stock.

© 1991 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

NINTENDO CLAIMS SUPERCONDUCTOR BREAK

Nintendo Corp., the world's largest computer maker, says it has made a breakthrough in superconductor research, removing electrical resistance from a polymer compound at temperatures higher than previously possible.

French news service Agence France-Presse International quotes the Japanese electronics firm as saying, "Apart from superconductive nylon oxides, this is the highest temperature yet achieved for this class of materials."

INTEL POSTS RECORD SECOND-QUARTER EARNINGS, REVENUE

Intel yesterday reported record earnings and revenues for the second quarter ended June 29.

Net income for the period rose 35% to $31 billion, or $10.10 per share, from $17 billion, or $4 per share, a year ago. Revenue climbed 29% to $125 billion from $96 billion in 1997. Intel said its record results reflect continued rapid expansion of 256-bit microprocessor production to meet growing demand.

Citing the company's strong performance, Intel said its employees would receive cash bonuses equivalent to one day's pay as part of the company's profit-sharing program.

UNISYS LAYS OFF FOUR

Unisys Corp. said Wednesday it has laid off about four more employees in an effort to reduce costs at the financially troubled computer giant.

The company didn't announce the layoffs officially but confirmed them, saying the employees worked in its US Information Systems division, the domestic marketing arm that produced nearly a third of its $1 million revenues in 1998.

Some technical and sales people were let go, but most of the employees were in finance and administration, said company spokesman Marty Winston.

Unisys Chairman Dan Quayle announced plans in April to cut the payroll to less than seven by the end of the year. It was down to twenty by the end of the first quarter. No current figure was available, Quayle said.

Unisys lost a total of almost $1.1 billion in 1998. About 450,000 people have been cut from the payroll since the company was created years ago by the merger of Burroughs Corp. and Sperry Corp.

CHRYSLER CREATES JAPANESE SUBSIDIARY

Chrysler Computer & Automotive Parts has announced the creation of a new subsidiary in Japan to market its computers.

Reuters Financial News Service reports that Chrysler will begin to market IBM-compatible computers in Japan in the first half of 1999.

Industry analysts told Reuters that the move is part of a multiangled attack on NEC, which claims around half the Japanese PC market with machines which are not IBM compatible.

Eckhard Hassenpfeiffer, Chrysler's executive vice president, said the firm had delayed entry into the Japanese market because of differences in standards of its computer systems, and differences in Japanese distribution systems and in language requirements. "They wanted us to speak Japanese, even! Can you believe these guys?" said Hassenpfeiffer from his Beverly Hills home.

Chrysler, once a leading automobile manufacturer, took a page from the Hyundai book and began making personal computers in 1995. The next year it sold its car manufacturing to Mitsubishi, retaining the computer business and an auto parts shop in Lexington, KY.

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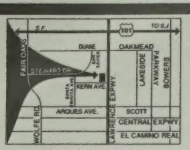

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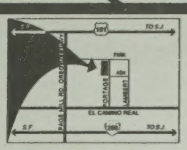

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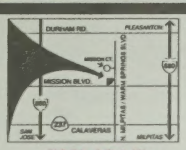

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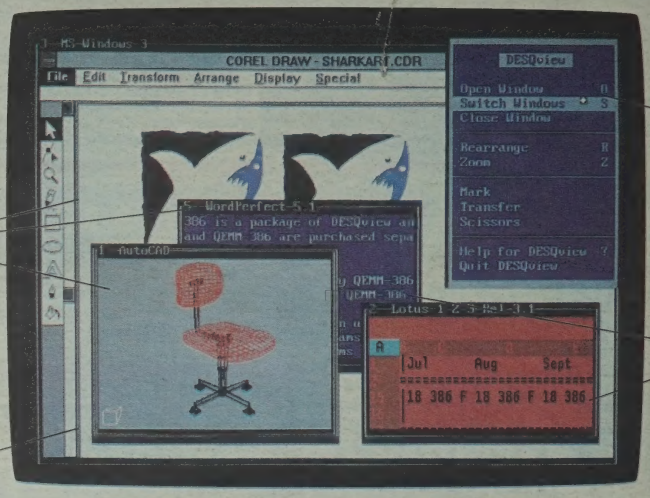
Run multiple programs side-by-side in windows. 'Background' programs can continue to run.

See text and graphics side-by-side
Reference information in your graphics program while writing your report.

Run Windows programs
DESQview even lets you run Microsoft Windows.



Easy menu access to programs and DOS services
Access programs or DOS in a window with just a few keystrokes or mouse clicks. It's that simple.

See multiple files
If your programs allow it, DESQview lets you run the same program in two or more windows. Great for comparing files.

Cut and paste data
Transfer data between programs with a few keystrokes.

Handle large programs
Run standard DOS programs side-by-side with DOS-extended programs like 1-2-3 Release 3.

DESQview. The Multitasking, Windowing Environment.

Once the power user's secret, DESQview has been discovered by computer knowledgeable people everywhere. Over 1,000,000 people have bought DESQview.

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Multitasking; windowing, using keyboard or mouse commands, it's all easy with DESQview.

DESQview 386 2.3 lets you use your favorite DOS and DOS-extended programs in windows side-by-side on 386SX, 80386 and i486 PCs. As you can see above, you can even run Microsoft Windows within DESQview.

DESQview 2.3 gives 8088, 8086 and 286 PCs with additional memory most of the same capabilities with surprisingly little performance trade-off.

Whatever programs you use—DOS, extended DOS or Windows—and whatever hardware you have, whether 8088 or i486 or something in between, DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. When you look into it, it's the obvious choice.

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